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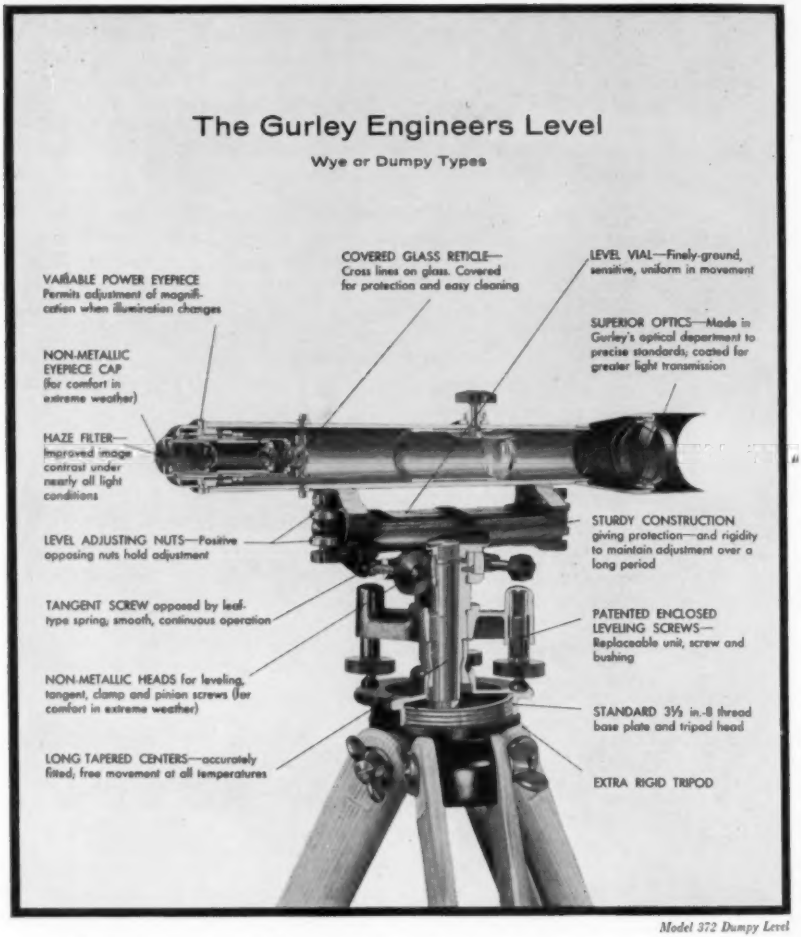
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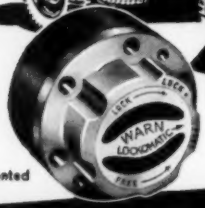

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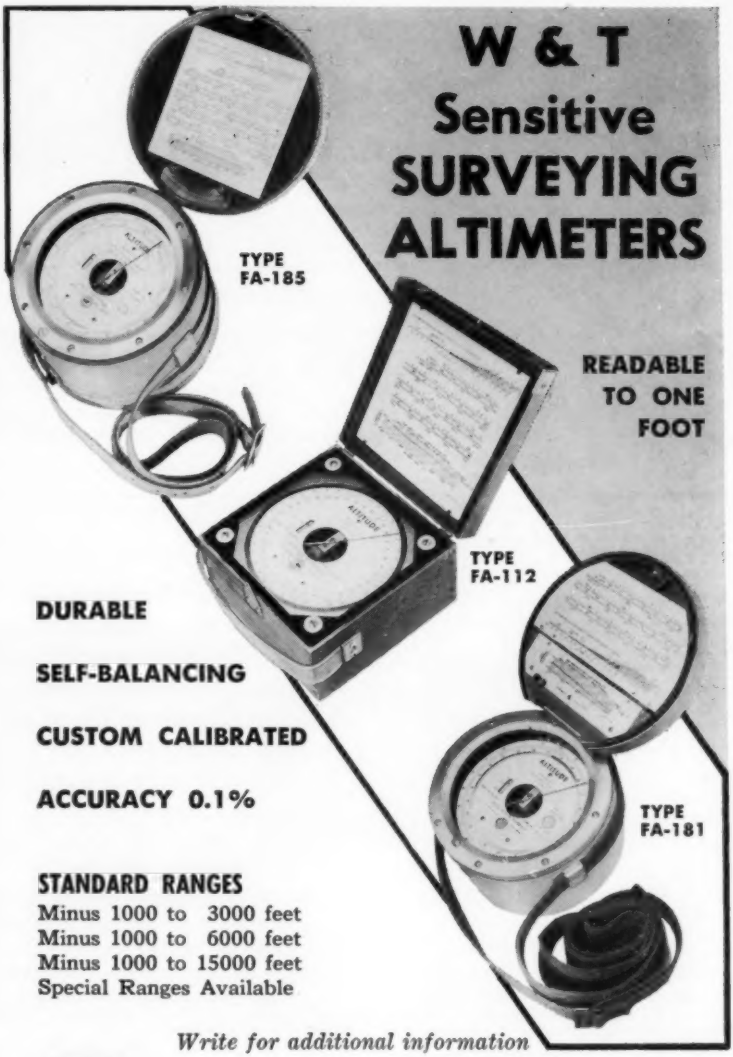

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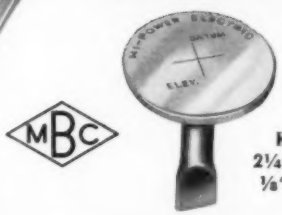

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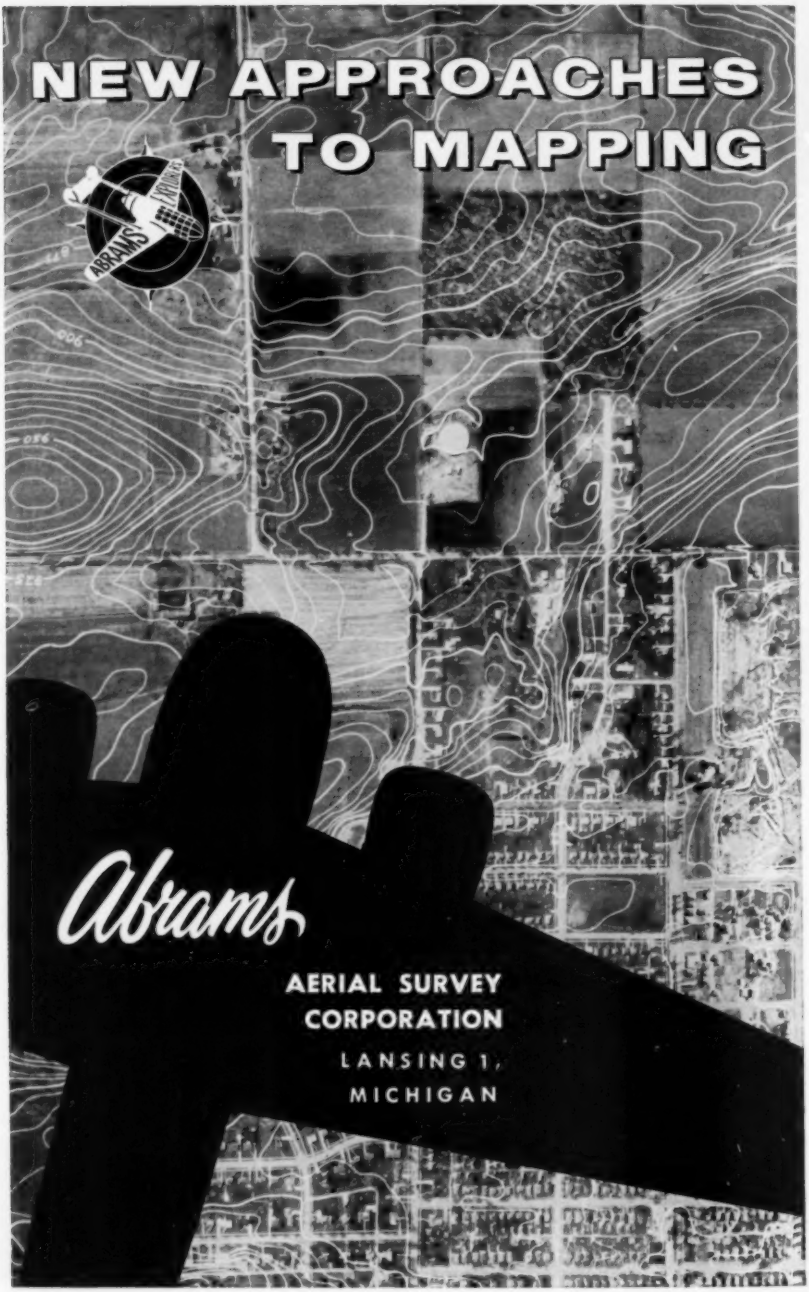
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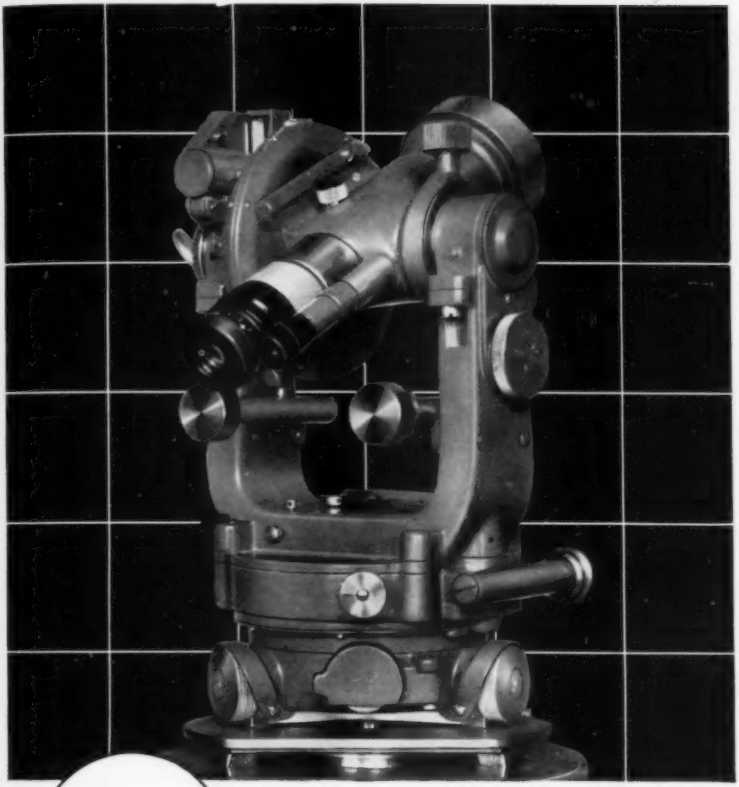

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Journalistic Cartography

By WALTER W. RISTOW

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CARTOGRAPHY TODAY is a highly specialized and standardized profession. Ingenious instruments, tools, and materials, and assembly-line methods and techniques, developed or perfected during World War II and the Korean War, have proved equally effective for peacetime map making. Thanks to such modern methods and equipment, the world is better mapped today than ever before. Annual production, for both civilian and military needs, runs into the tens of millions of map sheets.

Standardization and mechanization are most highly developed in government mapmaking agencies. Many official maps are based on original surveys, aerial and plane-table, and the sheets are published at large or medium scales. The maps are detailed and accurate and cartographically excellent. Mass produced as they are, however, many modern maps, both governmental and commercial, are stereotyped in format and appearance. They lack, moreover, the warmth, originality, and decorative artistry which characterize maps drawn in a less technical and standardized age.

Though they recognize the advantages of mass production, some cartographers deplore the diminishing opportunities for personal initiative, self-expression, and original craftsmanship in mapmaking. Happily, there are still a few sheltered by-ways where the creative cartographer may give free rein to his ideas and his pen. The field of journalism offers one such haven.

Journalistic cartography, as generally interpreted, is concerned with preparation of maps to illustrate and amplify stories and articles published in mass communications media ranging from daily newspapers to quarterly journals. Maps have illustrated newspapers and magazines since the seventeenth century. It is only within the past several decades, however, that the practice has become widespread. Public interest in maps and geography, intensified by the global scope of World War II, stimulated expansion of journalistic cartography. Since 1945, the Korean War, the "cold war" in Europe, the Middle East crisis, and an accelerated emphasis upon travel, have served to keep alive the geographical consciousness of the reading public.

In striving to simplify, for the layman, the understanding of maps and world geography, journalistic cartographers have been led to experiment with new ideas in map design and symbolization. This fresh and unconventional approach has revitalized cartography, for some of the techniques and ideas popularized in magazines and newspapers have been utilized for other types of maps.

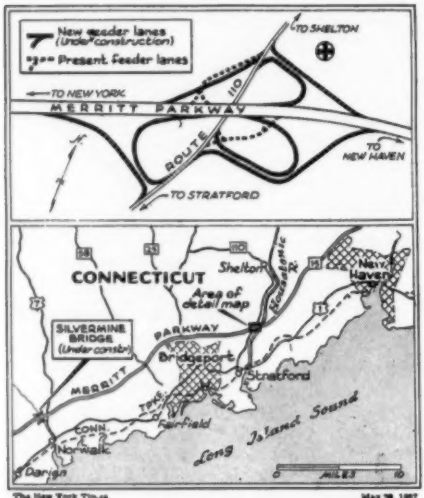
Cartographic requirements in journalism vary in accordance with editorial policies, interests and educational level of readers, frequency of issue, and reproduction limitations of the periodical's format and paper. Three categories or divisions of journalistic cartography may thus be recognized, associated respectively with (a) daily newspapers, (b) general and popular magazines (weekly and monthly), and (c) weekly newsmagazines.

The daily news cartographer is most restricted in artistic efforts. His maps must be simple line drawings which will give a clear reproduction on soft newsprint paper. With some few exceptions, newspaper maps are without color. The newspaper mapmaker always works under "rush" and "deadline" pressures which provide no opportunity for basic research, and a bare minimum of time for drafting. The maps he prepares must usually be tailored to rigid specifications prescribed by the editor.

Because of such limiting conditions newspaper maps have little individuality. Many

Grateful acknowledgment is made to Robert M. Chapin, Jr., Richard Edes Harrison, and Albert H. Farnsworth, Assistant to the Editor, *Holiday*, who read preliminary copies of the manuscript and made suggestions for improving the paper.

are crudely traced or adapted from a readily accessible atlas, and the cartography is often mediocre. Large metropolitan dailies, with professional cartographers or illustrators on their staffs, publish maps of better quality. The most common objective of newspaper maps is to locate places spotlighted in the news. The map may trace the path of a destructive hurricane, locate a new oil or mineral discovery, diagram a traffic accident, mark the site of a plane crash, or show the route traveled by the President of the United States on a visit to New York City. (Fig. 1)



Details of new $721,000 Merritt Parkway interchange at Stratford. Lower map shows interchange in relation to new bridge being constructed over the Silvermine River in Norwalk. Sikorsky plant (cross) is focus of traffic.

FIGURE 1.—Spot news in the daily press is illustrated with simple line drawings, such as this sketch map from the *New York Times* of May 29, 1957. (Courtesy *New York Times*)

Newspaper mapmaking, like other branches of cartography, attained its greatest development during World War II and the Korean War. Journals, many of which had previously disregarded maps, hired professional illustrators or elevated a talented copy boy to the post of staff cartographer. The resulting maps were not always good, but readers did get from them a better idea of the war's progress than they could have from the printed word alone.

Some of the best wartime newspaper maps were prepared by the late Emil Herlin and his associates and successors on the *New York Times* staff. (Fig. 2) Many *Times* maps located strategic resources and industries, or traced important routes and transportations systems. Others, more dynamic in character, showed the progress of battles, bombing objectives, or naval campaigns. Herlin maps often portrayed generalized relief features by hill sketching or hachuring. Actual or potential troop movements and lines of attack were dramatically indicated by a liberal use of arrows. *Times* maps were further enlivened by various tones of black and gray. Most Herlin maps are on standard projections. To show large ocean sweeps, however, he effectively employed the orthographic projection. A number of Herlin maps were reproduced in *The War in Maps, an Atlas of New York Times Maps,* published by Oxford University Press in 1942. Vaughn Gray of the *Times* staff added maps for the 1943 edition of the atlas, and Lucas Manditch, of the same newspaper, was the cartographer for the 1944 revision. Text for all three editions was prepared by E. Francis Brown.

Maps by Herlin were also used for the *War Atlas, a Handbook of Maps and Facts,* published in 1940 as one of Foreign Policy Association's "Headline Books." Frank R. McCoy, then president of the F.P.A., wrote in the introduction that "no newspaper has done a better job of [wartime] map-making than the *New York Times.* Day after day, and especially since the beginning of the war in Europe, that paper has published maps many of which are masterpieces of the art of simplification."

Other newspapers with large circulations such as the *Christian Science Monitor, Chicago Tribune, New York Herald-Tribune, New York Daily News,* and *Milwaukee Journal,* likewise had their own cartographers and used maps freely to chart the progress of the war. The *Christian Science Monitor Weekly Magazine Section* for April 12, 1941, featured a "Special Map Edition." It included seven black-and-white maps by

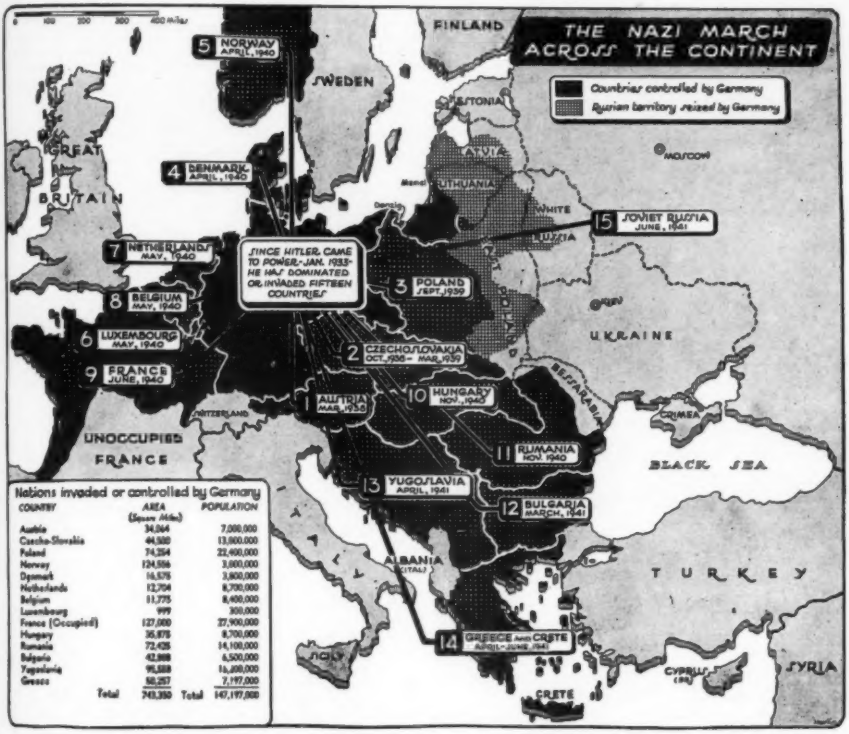


FIGURE 2.—This map, published in the *New York Times* in June 1941, illustrates the cartographic style of the late Emil Herlin. (Courtesy *New York Times*)

Lenz, a colored map of the Far East by Blattner, and two colored maps by Dr. Erwin Raisz, professional geographer and mapmaker and author of several books on cartography. The center-page spread, by Raisz, was a colored, perspective relief map of "The Mediterranean Sea." A world map by Raisz on the azimuthal equidistant projection, centered on Boston, was the cover illustration for the section. The Raisz maps are among the few contributions to journalistic cartography made by a professional geographer. The development of this branch of mapmaking, as will be seen in subsequent paragraphs, has been brought about almost exclusively by a small group of artist-illustrators with little or no previous training in cartography or geography.

Small newspapers depend upon news associations for cartographic illustrations. Wartime syndicated maps, prepared some days before publication, could not keep step with day-to-day combat progress. They presented instead such background information as topography, resources, fixed defense lines, communication routes, or summaries of major campaigns or battles. Cartographic techniques and conventions were similar to those used on maps prepared to amplify day-to-day news stories. The maps included sketches of factories, vegetation, ships, oil wells, gun emplacements, etc., as well as arrows, circles, barbed "fronts", and bomb bursts. Relief was shown more often on syndicated maps than on those prepared by daily news cartographers.

Only a few wartime press association maps carried by-lines. Associated Press

FIGURE 3.—H. C. Detje made effective use of pictorial sketches, symbols, and shaded relief on his dynamic maps which portrayed the battle fronts of World War II. This map was published in the now defunct newspaper *PM*.

maps signed by H. C. Detje showed more originality and better cartographic feeling than most wartime syndicated maps. Prior to his work with AP, Detje served as staff cartographer for the short-lived New York City newspaper *PM*, where he developed his distinctive cartographic style. (Fig. 3) A Pulitzer prize was awarded Detje for excellence of his AP cartography.

A popular postwar syndicated series is Associated Press' "Background Maps for AP Newsfeatures." The maps, which illustrate feature stories, deal with a variety of interests. Some recent domestic examples show States which are "segregated" and "unsegregated", county and State residence requirements for voting, the voting record in the South compared to the rest of the nation in the last four presidential elections, hurricane tracks for each of the last four years, and incidence of polio for the year preceding the widespread use of Salk vaccine, paired with a map showing incidence for the 1956 season. Maps of foreign areas

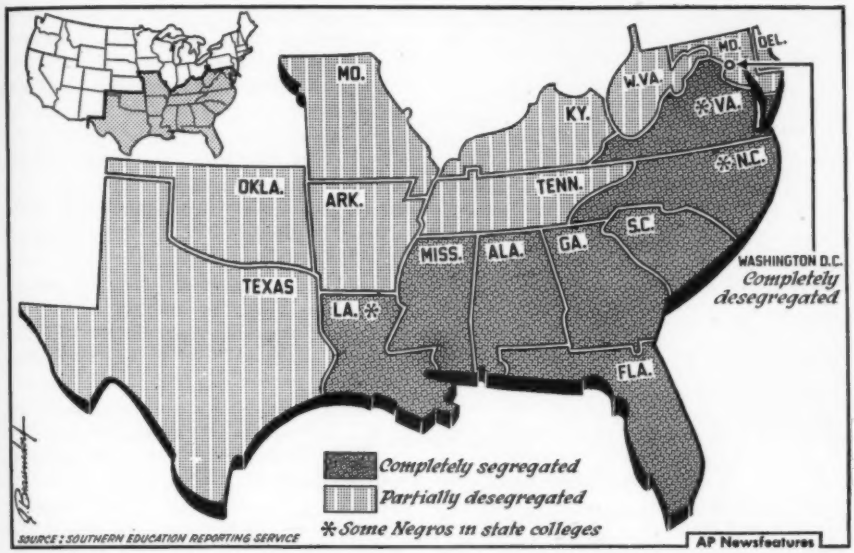


FIGURE 4.—AP Newsfeatures maps by Braunsdorf are characterized by a high degree of generalization and simplification. (Courtesy M. J. Wing, General Editor, AP Newsfeatures)

have featured the Arab population of North Africa and the Middle East, distribution of World Bank loans, oil areas and production in the Middle East, and the gradual erosion of Britain's historic lifeline.

G. Braunsdorf and S. Kohler have drafted a number of AP Newsfeature maps. The cartographic style of both artists is simplified and generalized. On Braunsdorf's United States maps, generalization is carried so far as to round off most coastal and boundary irregularities. (Figs. 4 and 4a) Resource and products maps are usually pictorial in style. To illustrate certain ideas and concepts, exploded and distorted maps are sometimes used.

A few newspapers have featured maps, black and white or in color, in Sunday supplements. Some supplement maps provide background for news, while others have no direct relationship to the news and are designed primarily to educate their readers, or as a premium to stimulate circulation. Maps of the latter type are usually printed in eye-catching colors, and are often embellished with illustrations or decorative borders.

The *St. Louis Post-Dispatch* for Sunday, September 12, 1954, included a special atlas section entitled "This Troubled World," with seventeen full color maps. Among them were seven by Richard Edes Harrison and two by Antonio Petruccelli, both top-ranking journalistic cartographers. The remaining items were reproductions of commercial maps. The front cover illustration was a colored globular map of Southeast Asia by Harrison. The projection, specially devised for the *Post-Dispatch* atlas, "shows the geographical landscape as it would be seen from the height of 1,635 miles. . . . Such a 'short-focus' perspective has the unique virtue of showing a given area at relatively large scale in the center while preserving the sense that the rest of the world lies beyond the horizon."

It is in general periodicals and in weekly news-magazines that journalistic cartography has had its fullest flowering. "In the magazines especially [the artists'] freedom

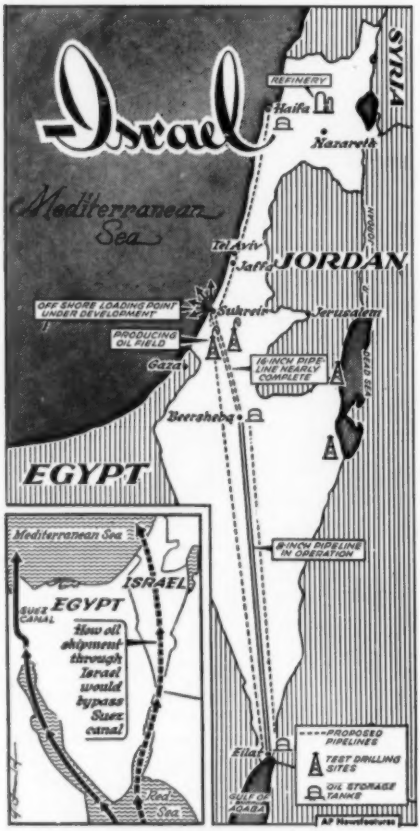


FIGURE 4a.—The significance of oil in the problems of the Middle East is emphasized on this AP Newsfeatures Background Map. (Courtesy M. J. Wing, General Editor, AP Newsfeatures)

of cartographic traditions has paid dividends. In spite of many naive mistakes, they have borne the burden of making the public conscious of global geography. . . . It is among the weekly and monthly magazines . . . that the greatest assault upon tradition has been made."*

Many of the cartographic principles, techniques, and styles which have evolved are common to both types of magazines. The mapmaker for a general magazine, however, works under a less limited time schedule, has greater variation in the subjects and topics he is called upon to illustrate, and has more latitude in the use of colors than does the newsmagazine cartographer. It is in the former field, therefore, that some of the most significant cartographic innovations have been made. Many principles of design, first presented within the covers of general magazines, have had an impact upon older and more conventional branches of cartography.

Maps are published, more or less frequently, in a number of periodicals of general interest such as *American, Better Homes and Gardens, Fortune, Holiday, Life, Look,* and *Saturday Evening Post.* In this field, too, map frequency reached a peak during World War II. Maps were used most often to illustrate articles on military or political policy and strategy, or which presented background data on some specific area or problem. More recently travel stories have been the inspiration for map illustrations in this magazine group.

The foundations of modern magazine cartography were laid in the nineteen thirties. During these years most Americans were concerned primarily with internal and domestic problems. Much of the news was focused on the Great Depression, the Dust Bowl, Chicago's "Century of Progress," trans-Atlantic flights, and the New York World's Fair. There were some rumblings, however, of the storm which was shortly to thunder down upon the earth. In 1934 the United States established diplomatic relations with the Soviet government. The following year Italy's Fascist army invaded Ethiopia, the peoples of the Saar voted to reunite with Germany, and Adolf Hitler repudiated the Versailles Treaty. Nazi troops invaded the demilitarized Rhineland in 1936, the same year which witnessed the start of the Spanish Civil War. In 1937 Japan overran China. In 1938 Hitler occupied Austria, and the Munich Pact was signed.

The magazine *Fortune* has played a foremost role for more than 20 years in fostering and promoting journalistic cartography.

* Harrison, Richard E. The war of the maps. Saturday Review of Literature, Aug. 7, 1943: 27.

Maps in color were a feature of its first number, published in February, 1930, and for two decades they enlivened the pages of many succeeding issues. During the first six or seven years *Fortune* maps were contributed by a number of freelance illustrators. With one or two exceptions, this venture into cartography was a wholly new experience for them. They have been described by one of their number as including, for the most part, "commercial artists or reformed architects." Because they were not bound by cartographic traditions or conventions, the artist-cartographers were willing to experiment. The immediate results were not always artistic or cartographic triumphs. Over a period of years, however, there emerged a distinctive and original style of mapmaking, which set the pattern for American journalistic cartography.

Maps in the earliest numbers of *Fortune* are unsigned. A colored map of French wine-producing regions in the May 1930 issue carries the signature of Ernest Clegg, who had already earned recognition for several artistic map murals and attractive pictorial maps, and who designed other *Fortune* maps during the next several years. Other illustrators, whose maps were published in the magazine during the thirties, were LeRoy Appleton, Artzybasheff, Ernest Hamlin Baker, Richard Edes Harrison, Joseph Johnson, William Longyear, Antonio Petruccelli, the Mexican artist Diego Rivera, and Stephen Voorhis. A number produced only two or three maps, but Appleton, Harrison and Johnson were fairly regular contributors.

Prior to 1937, *Fortune* cartography had little uniformity in style or character. In general the maps were pictorial or diagrammatic, and the majority were in color. The large page of the magazine provided an effective cartographic base, and some maps spread across two pages. Standard projections were used for most early *Fortune* maps, but in coloring and cartographic techniques they showed many departures from conventional commercial practice.

Prepared as they were to illustrate specific articles, the maps embraced a wide range of areas, subjects, and scales. They portrayed the entire world as well as such localized segments of it as Newport, Rhode Island and Kings Ranch in Texas. Popular pre-war subjects were commerce and industry. Representative examples were railroad maps of the United States, Canada, eastern United States, and the Pennsylvania system. Also effectively presented on maps were the distribution and extent of such industrial empires as the Texas Corporation, Japan's Mitsui, International Telephone and Telegraph, Anaconda Copper, Commonwealth and Southern Power, and Gulf Oil.

International politics received only occasional cartographic attention in *Fortune* before 1938. One noteworthy exception was the November 1935 issue which featured a "Portfolio of Maps of Ethiopia" to illustrate a story on the Italo-Ethiopian conflict. Appleton and Harrison collaborated on the "Portfolio," which included both black-and-white and colored maps. This was *Fortune's* most ambitious cartographic project up to that time. Harrison's "Vulture's View" of Ethiopia, oriented with southwest at the top of the page, introduced the perspective map to journalistic cartography.

Following the Ethiopian job, Appleton and Harrison shared *Fortune's* cartographic chores for several years, with occasional assists from other illustrators. Trouble in the Far East inspired an article, in the September 1936 number, which was illustrated with a Harrison map of the "Five Japans." The following February, Appleton utilized the perspective technique to present a "Hitler-eye View of Britain." Oriented with west at the top of the page, the map gave to the reader the same view of the British Isles as was observed by the German Führer. The projection for the map was laid out by Harrison, who continued to use variations of it on many subsequent *Fortune* maps.

The *Fortune*-Harrison association was mutually advantageous and unusually productive. For two decades Harrison maps brightened the pages of the magazine, and stimulated new interest in cartography and in the understanding of modern global geography. While a number of other artists prepared cartographic illustrations for *For-*

tune, in the years immediately preceding and during World War II, Harrison's maps had the greatest popular appeal and seemed best to portray the geographical concepts of the time. The distinctive cartographic style which he developed, with the full cooperation of the editors, came to be accepted as characteristic of *Fortune* maps. This style, as Harrison has noted, was not "a matter of inventing new projections, but simply using old but highly pertinent ones which have been gathering dust for centuries."*

Among the projections revived by Harrison for *Fortune* readers were the perspective (Nov. 1935), the azimuthal equidistant (April 1936), the orthographic (Sept. 1936), the gnomonic (May 1943), the doubly equidistant (Sept. 1945), and the azimuthal equal area (Oct. 1945).

Adaptations of the orthographic projection formed the framework for globular perspective maps. A novel and interesting effect was achieved by departing from the orthodox practice of placing north at the top of the map sheet. The December 1937 issue of *Fortune* dramatically featured this new approach with a four-page fold-in Harrison-Petruccelli map. Titled "South America in Globular Perspective," that continent was presented as it would appear if viewed from the southeast at an elevation of about eight thousand miles. Generalized relief was shown by a combination of perspective sketching, shading, and color. Tones of green marked lowlands and gradations of tan, buff, and orange indicated more elevated areas. Oceans and other water features were portrayed in pleasing blue tints. Distinctive products, vegetation, and landmarks were pictorially presented for the several countries. A small inset map outlined the major transportation network of the continent. Most of these features were to become standard for Harrison-*Fortune* maps published during the next decade or so.

The European crisis had become more acute by 1938, and in the August *Fortune,* Harrison's double-page, colored, perspective map of Czechoslovakia focused attention on the fate of that unfortunate country. Maps of Venezuela (March) and Brazil (June) illustrated stories during the first half of 1939. Before that year ended Europe was in arms. Basic geographical data for understanding the first battle area of the war were presented in series of maps of Germany (October) and Poland (December) prepared by Harrison. The July 1940 *Fortune* recognized the Battle of Britain with a double-page Harrison map of the British Empire, appropriately titled with Winston Churchill's immortal words "Blood, Toil, Sweat, and Tears."

Harrison utilized the polar azimuthal equidistant projection to illustrate the new "global" problems, in the July 1940 and August 1941 issues. These were not, however, the earliest appearances of this projection in *Fortune,* as it had been employed by Harrison for a map showing the Pan American Airways system in the April 1936 issue. R. Buckminster Fuller's "World Energy" map in February 1940, was also centered on the North Pole. The North Pole-centered projection typified by the "World Divided" map of July 1940, found ready acceptance, and became associated in the popular mind as the symbol of "air age" geography. Within the next few years virtually every map publisher, commercial as well as governmental, placed upon the market his own particular adaptation of the Pole-centered "air age" map.

The "air-age" projection became firmly established with publication, in March 1942, of Harrison's "One World—One War" as a four-page fold-in map supplement. *Fortune's* publishers wisely distributed extra copies of this colorful azimuthal equidistant map, and it became a standard wall decoration in thousands of governmental and civilian offices.

Several other Harrison maps were distributed as *Fortune* supplements in 1942 and 1943. "Atlantic Arena" (Jan. 1942), "Pacific Arena" (Sept. 1942), and "World Island" (Jan. 1943) were all on orthographic grids and helped immeasurably in reviving this projection. "Great Circle Airways," which accompanied the May 1943

* Harrison, op. cit.

FIGURE 5.—The oblique globular-perspective map, introduced to journalistic cartography by Richard Edes Harrison, is typified by this map published in the January 1943 issue of *Fortune*. The reduced, black-and-white reproduction does not do full justice to Harrison's distinctive style of mapmaking. (Courtesy Richard Edes Harrison and *Fortune* magazine)

Fortune, introduced to the magazine's readers the grotesquely distorted, but extremely useful, polar gnomonic projection.

To portray the detailed geographic character of selected portions of the globe, Harrison made effective use of perspective maps. An article in *Life*, describing his style and technique, notes that "in a perspective map a part of the world is seen from a vantage point high above the earth so that the distances draw together in perspective, as they might to an incredibly farsighted man poised at an altitude of many miles. Perspective maps are not new to map technique but they have rarely been done so accurately and artfully as Harrison does them. . . . The perspective maps are based on the obvious truth that the shapes of countries and continents change their look when the point of view changes."* (Fig. 5)

Among Harrison's more popular wartime maps were "Southeast to Armageddon" (Feb. 1942), a perspective map of the Middle East as viewed from Berchtesgaden, "Arctic Arena" (July 1942), portraying the northern hemisphere on the polar orthographic projection, a perspective relief map of Europe viewed from the southwest, aptly labelled the "Not So Soft Underside" (Jan. 1943), "Approaches to Tokyo" (Dec. 1943), as viewed from Alaska, the Solomons, and Burma, and double-page perspective maps of Japan (April 1944), and China (April 1945). Reprints of many Harrison maps were distributed and enlargements of some were made by military agencies for use in servicemen's training and orientation programs. A number of Harrison-*Fortune* maps have been reproduced in books, pamphlets, and other magazines. The record is held by the "Not So Soft Underside" with more than thirty reprintings.

In 1940 Time Inc. issued the *Atlas for the U.S. Citizen*, a series of eight Harrison maps originally published in the September 1940 number of *Fortune*. A more comprehensive

* *Life*, Feb. 28, 1944: 56.

selection of his wartime output is contained in Harrison's *Look at the World, The Fortune Atlas for World Strategy,* published in 1944 by Alfred A. Knopf. Text for both atlases was prepared by editors of the magazine. In the cartographer's *Acknowledgments* and introductory remarks, and the editors' Preface of *Look at the World* the principles, techniques, and objectives which produced the distinctive *Fortune* cartographic style are summarized. The maps, we note from the Preface, "try to show *why* Americans are fighting in strange places and *why* trade follows its various routes. They emphasize the geographical basis of world strategy."

Although cartography related to the war and its strategic background excited most interest, maps less martial in subject also appeared in *Fortune* during the period 1939 to 1945. Nor was Harrison the sole cartographic contributor. For example, three colorful murals of the Pacific area, prepared by the Mexican artist Covarrubias for San Francisco's Golden Gate Exposition, were reproduced in the May 1939 *Fortune*. Petruccelli contributed a four-page fold-in map of the Pacific Northwest in March 1940, and Clegg drew a sketch map of a housing development in Red Hook, New Jersey for the following issue. In May 1940 Harrison used a distorted technique to picture the "World According to Standard (N.J.)". The August 1940 number included Petruccelli's pictorial map "Oahu is Hawaii," Elmer Smith's portrayal of the United States "Empire of Natural Gas," and an unsigned chart tracing the path of oil movement from Venezuela to the U.S.

Artzybasheff's "China" appeared in December 1940, and his "World Airways," on the Mercator projection, was in the March 1941 issue. "Grand Strategy of World War II" was illustrated by a series of maps prepared by Philip Ragan Associates for the July 1941 *Fortune*. An unsigned hypothetical map, in the September 1942 number, pictured "The World Patent Cartel." Also without signature is an azimuthal projection of the world centered on Canada, illustrating "Canada's Post-War Air Policy" (May 1943). Except for those by Harrison, most *Fortune* maps printed in 1943, 1944, and 1945 were unsigned.

The end of World War II, and a change in *Fortune* editors and policy, resulted in a decreased emphasis upon maps after 1945. A perspective map of the "West Coast" (Feb. 1945) was the first of a projected series of Harrison-*Fortune* views of the United States. Only one other, "Yankee Prospect," was published. The September 1945 issue carried Harrison's "The World and I. T. & T.," laid out on a two-point equidistant projection, and the following number included his "Sugar Where it Grows and Where it Goes," on a North Pole-centered azimuthal equal area projection.

The infrequent maps which appeared in *Fortune* during the next four years were prepared by various illustrators. On the whole, they added little to the magazine's stature in the field of journalistic cartography. Harrison's cartographic skill was again utilized by *Fortune* in the early nineteen fifties. The twentieth anniversary number (Feb. 1950) included his "The Communist Fastness," and "Asia's Southern Bastion," both perspective maps. "The Yankee Prospect," a two-page perspective map of New England, appeared in March 1950, and the same technique was used for his "Commonwealth of Australia" map in that year's October issue.

"Europe's Oil is in Danger" (March 1951), a double-page perspective map, pictured the Middle East as viewed from the U.S.S.R. "U. S. Commitment" (Jan. 1952), a four-page insert map, on the polar azimuthal projection, was a redraft of the earlier "One World—One War" supplement. It was designed to help *Fortune* readers "see where and how and for how much your government has pledged America's future around the world." In commenting on the "U. S. Commitment Map" and its maker, the editor noted that "Harrison has been *Fortune's* mapmaker for sixteen years, and in that time his once startling departure from the Mercator projection has become accepted as a more accurate reflection of the world's roundness than the world of Mer-

cator." This testimonial was, in effect, the epilogue to the Harrison-*Fortune* association, for only one more Harrison map "Canada from the Southwest" (Aug. 1952), was published in the magazine.

During the past five years *Fortune* maps have been few in number and, for the most part, cartographically undistinctive. A noteworthy exception is Petruccelli's colorful pictorial relief map of the Belgian Congo in the November 1952 issue. Statistical or climatic data have been presented most often on recent Fortune maps. Max Gschwind and Alexander Semenoick, staff illustrators, have been the most regular cartographic contributors since 1953. A colored pictorial map of Alaska (Sept. 1955), prepared jointly by these two men, is particularly worth noting.

During the last decade some of the best examples of journalistic cartography in the general magazine field have appeared in *Holiday*. An editorial policy statement in the first number (March 1946) noted that "*Holiday* is designed for this new postwar world, a world in which recreation will be more important to everyone in this busier world of new stresses and strains because more and more doctors are prescribing escape, and travel, and fun." No less than seven maps illustrated the March 1946 *Holiday*, and a portion of a globe photograph decorated the cover. Mostly of the sketch type, the maps provided background information for specific articles. Clayton Whitehill's double-page United States map picturing the "Wild Flowers of Spring," however, was the first in a series of gay and colorful *Holiday* maps featuring recreation and "escape" themes. More artistic than cartographic, they were appropriately designated by the editors as "cartographs."

Among other early "cartograph" subjects were "Indian Art," by Joseph Feher (April 1946), "National Parks of U.S. and Southern Canada," by Maurice Freed (June 1946), "Land of Lore and Legend," by William Gropper (Sept. 1946), "Animal Kingdom U.S.A.," by Taylor Poore (Oct. 1946), "Ducks, Geese, Swans and Where They Fly," by Jacob Bates Abbott (Nov. 1956), "Florida Big Sunshine," by Arnold Blanch (Dec. 1946), and "The Christmas Story," by James Lewicki (Dec. 1946). The January 1947 issue featured Libbie Lovett's map of "California Looking East from the Pacific," which represented one of the few departures, on a *Holiday* map, from conventional north-orientation. The California map introduced a selection of State cartographs of which Maine (Aug. 1947), Washington (Sept. 1947), North Carolina (Oct. 1947), Maryland (Nov. 1947), Texas (Oct. 1948), Wisconsin (July 1949), Michigan (July 1957), New Hampshire (Sept. 1951), Louisiana (Oct. 1952), Arizona (Jan. 1953), and Virginia (Nov. 1955) have been published to date. As was true of subject cartographs, the State maps were prepared by a number of artists. They are all similar, however, in their pictorial treatment. The maps of Virginia and Louisiana employed the technique of superimposing color photographs on outline maps.

Eye-catching cartographs have also been published showing tourist attractions in the central areas of Philadelphia (April 1946), London (July 1947), Chicago (Oct. 1951), Rome (April 1952), Paris (April 1953), and London (April 1956). Maps of the United States in the September, October, and November 1946 numbers of *Holiday* presented climatic data by Dr. Paul Siple, distinguished climatologist, geographer and polar explorer. In the February 1947 issue there was a "February Snow Map" based on snowfall interpretation by Siple, Weldon Heald, and Robert D. Campbell.

Holiday editors recognize the value of maps and make use of them whenever it is felt they can clarify or improve a story. Small spot or sketch maps are frequently used to locate places mentioned in the text. (Fig. 6) Multicolor maps, of page size or larger, illustrate major articles or special features. An example of the latter is the attractive Petruccelli map of South America featured in the special "South America" number of *Holiday* for November 1956. (Fig. 7) In recent issues the cartographic trend has been away from ornamentation and decoration, with the objective of making the maps more informative.

FIGURE 6.—*Holiday* makes frequent use of small sketch or outline maps, such as this one, to locate places referred to in articles. (Courtesy *Holiday* magazine)

In contrast with the Harrison-*Fortune* association and resultant distinctive cartographic style, no characteristic *Holiday* map pattern has developed, nor is there any one artist-cartographer whose style is associated exclusively with the magazine.

This is in part by design, for in planning a map feature the editors attempt to select an illustrator whose style and technique are in harmony with the character or "tone" of the region to be portrayed. For example, if a map were desired for such a "modern" city as Sao Paulo, Brazil, an artist with a contemporary style would be engaged. To portray the gaity and charm of Paris a cartographer with a light, delicate touch might be sought. Since the beginning of 1954, Petruccelli has dominated the *Holiday* cartographic picture, with published maps of Africa (Mar. 1954), the Southern States (Oct. 1954), London (April 1956), and South America (Nov. 1956).

Although *Holiday* maps do not strive for cartographic perfection, they are informative as well as esthetically pleasing. They may contribute little to scientific cartography, but *Holiday* maps do a real service in promoting public appreciation of geography and maps.

Life, launched November 23, 1936, introduced a new pictorial trend into the general magazine field. The expectation that cartographic illustrations would be freely used was only partially realized, and for the early years maps appeared quite infrequently. Many of those published were of the small sketch type, and uncolored.

It is perhaps worth noting that several line maps, illustrating an article on western reclamation and power projects, in the first issue of *Life* (Nov. 23, 1936), were prepared by Richard Edes Harrison. During the next decade or so Harrison served as a cartographical and geographical consultant for *Life*, although he personally prepared few maps for the magazine during these years.

Some early *Life* cartographic features were a double-page map of North America and the Pacific, by Petruccelli, in the April 26, 1937 number, an unsigned shaded relief map of Spain (July 12, 1937), and a colored, pictorial map of the island of Bali by Miguel Covarrubias in the September 27, 1937 issue.

After America entered World War II, *Life* featured maps frequently to spotlight strategic areas and to summarize activities in the several combat theaters. (Fig. 8) Most wartime *Life* maps were prepared by staff artists Frank Stockman and Anthony Sodaro, with occasional help from free lance illustrators Elmer Smith, Harold Faye, and others. Leydenfrost contributed a number of interesting black-and-white perspectives.

Stockman-Sodaro maps used conventional projections and orientation, and none were in color. By skillful use of airbrush techniques, the maps were presented in various shades of gray and black. Sharp contrast of tones was avoided by eliminating white areas. Large water expanses were customarily shown in black, with lighter grays marking land areas. Many *Life* wartime maps were of the dynamic or action type, and were liberally decorated with movement arrows, fronts, bomb bursts, circles, fortified strongholds, and symbolic airplanes, ships, flags, and national insignia. Boxes on

FIGURE 7.—Cartographer Antonio Petruccelli has prepared colorful and attractive maps for a number of magazines. The original of this shaded relief map of South America featured various tones of green. (Courtesy Antonio Petruccelli and *Holiday* magazine)

FIGURE 8.—This perspective map is representative of *Life* cartography during World War II. (Courtesy *Life* magazine)

the face of the map enclosed descriptive information.

Photographing three-dimensional relief models was an interesting *Life* cartographic technique. The models, of various combat theaters, were prepared by the Norman Bel Geddes studios. By placing miniature ships, tanks, planes, troops, smoke screens, etc., on the models very realistic battle scenes could be simulated. Photographs of a sequence of such settings gave an unusually realistic picture of significant actions.

The March 1, 1943 issue of *Life* featured R. Buckminster Fuller's "Dymaxion World," for which Harrison did the cartography. Portions of the world were outlined in color on triangular segments. Printed instructions provided guidance for cutting out and assembling the segments to form a multifaceted "near-globe." This proved to be a popular exercise, and many *Life* readers added to their knowledge of map projections and world geography by patiently fitting together the map segments.

To help wartime readers understand maps better, *Life* published, in its August 3, 1942 number, an article entitled "Maps, Global War Teaches Global Cartography." This

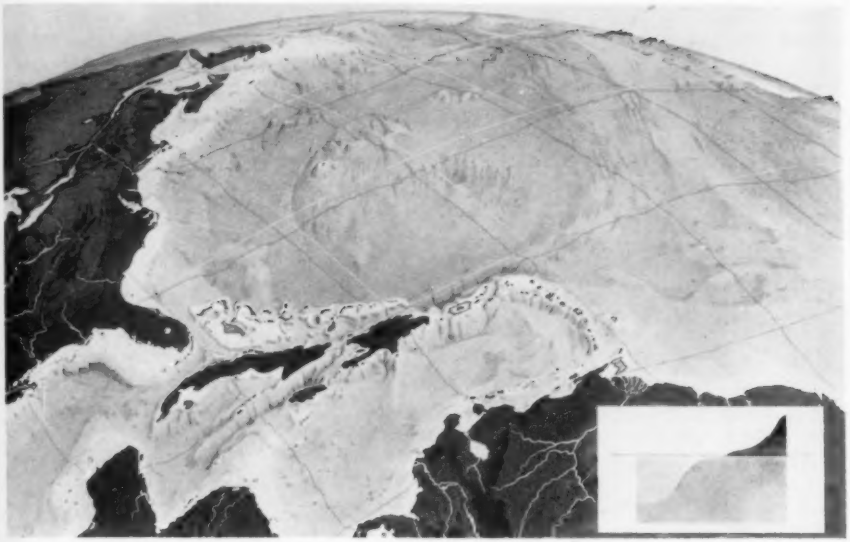


FIGURE 9.—This Harrison perspective map appeared in full color as an illustration for one of the sections of *Life's* special feature series entitled "The World We Live In." (Courtesy Richard Edes Harrison and *Life* magazine)

excellent and informative treatment of a technical subject, prepared by Gerard Piel, was one of the first comprehensive treatises on projections in a popular magazine. Among the specialists who prepared illustrations for this cartographic feature were Richard E. Falconer, Harold Faye, Norman Bel Geddes, Harrison, Erwin Raisz, and George T. Renner, Jr., as well as staffmen Sodaro and Stockman. The article was inspired by the belief that "no one can read the map of this war until he has comprehended the fact that the world is round and that no map can give an entirely truthful picture of its surface."

The use of map illustrations in *Life* declined noticeably after World War II. Sodaro, who prepared many *Life* war maps, has continued as staff cartographer preparing line maps, for the most part, to locate places mentioned in articles. An occasional Leydenfrost perspective has also appeared in postwar issues, e.g., the pictorial sketch of the "Old City of Jerusalem" (Dec. 24, 1951), the map of the North Sea illustrating meteorological conditions responsible for the destructive storm in early 1953 (Feb. 16, 1953), a perspective of the Mississippi River delta showing underwater oil bearing formations (May 11, 1953), and a birdseye view of the Great Lakes-St. Lawrence waterway project (May 17, 1954).

Life's greatest contributions to postwar magazine mapping have been made in special feature issues. To illustrate these numbers the editors have called upon such seasoned journalistic cartographers as Harrison, Lewicki, and Petruccelli. Thus, the Asia feature of December 31, 1951, included two colored perspectives by Harrison and a pictorial map by Lewicki. Harrison and Petruccelli prepared the colorful maps for the special issue on Africa (May 4, 1953), and Lewicki and Harrison illustrated the Germany feature of May 10, 1954.

At intervals of approximately two months, from December 8, 1952 to December 20, 1954, *Life* ran a series of educational articles under the general title "The World We Live In." The articles, compiled by Lincoln

Barnett, were generously illustrated with colorful scenes, diagrams, graphs, and maps. Part II, subtitled "Miracle of the Sea," (Feb. 9, 1953) included two Harrison perspective maps and three ocean-current charts by Petruccelli. (Fig. 9) A sequence of block diagrams, by Simon Greco, portrayed the geological evolution of the New York City area in Part III, the "Face of the Land."

"The Canopy of the Air" (June 8, 1953) included Petruccelli's "The Undulating Atmosphere," a map of North America over which air systems were superimposed, with a three-dimensional effect. Several small line maps by Harrison were also in this section. Unusually well done was Petruccelli's submarine relief map of the coral reef along the Queensland Coast of Australia which illustrated Part VII, "The Coral Reef." Harrison's perspective relief map of the Sonoran Desert area was a highlight of the chapter entitled "Land of the Sun" in the April 5, 1954 *Life*. The thirteen sections of "The World We Live In" were assembled and published by Time, Inc. in 1955.

Weekly newsmagazines have offered a fertile field for the cultivation of journalistic cartography. Some of the most novel developments, of this phase of mapmaking, have been presented on the pages of such magazines. As for journalistic cartography in general, the major contributions in newsmagazine mapmaking have been made by a small group of dedicated illustrators, under the enlightened guidance of a few map-minded editors and publishers.

Newsmagazine cartography started, on a small scale, in the early thirties. After several experiences with mediocre mapmakers, *Time* engaged Richard Edes Harrison as cartographer in 1932. One of his first endeavors was a black-and-white United States election map for the October 31, 1932 issue. Commenting recently, Harrison recalls that "this little turkey was on the Mercator projection!" and adds, "when I look at some of these early jobs, I wonder why this cartographic career wasn't nipped in the bud." The number of maps printed in *Time* before 1938 was not great. Those drawn by Harrison are identified by his name or initials. Although uncolored line drawings of simple design, they had some of the distinctive features which became hallmarks of later Harrison maps.

Robert M. Chapin, Jr., laid the foundations for his cartographic style in a series of unsigned black-and-white maps printed in *Newsweek* during the period 1935 to 1937. In 1935 the editors of *Fortune* began calling upon Harrison's cartographic skill. The increased emphasis upon maps in both Time, Inc., magazines, soon proved to be too great a load for one man, and after 1937 Harrison discontinued regular work with *Time* in order to concentrate on *Fortune* maps. During the next several years he prepared occasional maps for *Time*.

Chapin was persuaded to leave *Newsweek* to take over the cartographic work for *Time*. In January 1938 the first Chapin maps, complete with byline, appeared in the latter magazine. Almost every number of the periodical since that time has carried one or more Chapin maps. The *Time*-Chapin association, extending over almost two decades, has been one of the major pillars of American journalistic cartography. Chapin maps have established a pattern and style for modern newsmagazine cartography.

Although Chapin's earliest *Time* maps were nonmilitary in subject, it was in portraying actions and movements in the various wars of the last twenty years that his cartographic style proved most effective. Chapin maps have helped the public to a better understanding of the backgrounds and campaigns of the Spanish Civil War, the Finnish-Russian campaign, Japan's invasion of China, World War II, the Korean War, the "Cold War," the Indo-China Campaign, and the recent Middle East conflict.

The Chapin technique is based almost entirely upon use of the air brush. The background of the map is developed in tones of black and gray. On some maps large water bodies are shown in solid black with land areas in lighter grays. In other instances black is used for land masses and oceans are in gray tints. Black lettering is used on light areas of the map and white or gray is overprinted on the solid black. For greater dra-

matic effect, red lettering and symbols were used on many wartime maps.

To clarify battle actions, "fronts," encirclements, etc., the cartographer utilized a variety of conventional symbols, and devised many new ones. The advances of armies were effectively shown with arrows, bomb-burst symbols marked targets of aerial bombardment, and barbed red lines (sometimes studded with gun emplacements) located battle lines or fronts. A sketch of a reading glass, on some maps, served to focus attention on a specific area. Similarly, representations of pincers, clamps, nets, and

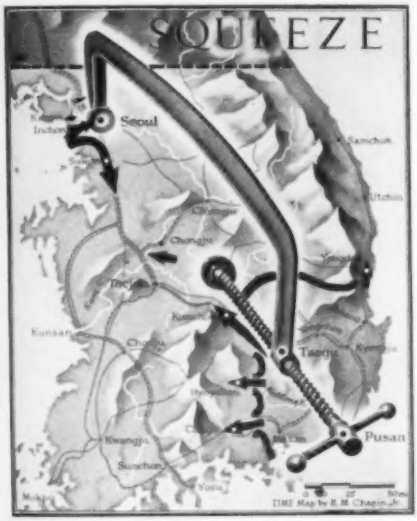


FIGURE 10.—Cartographer Chapin's wartime maps utilized such suggestive symbols as C-clamps and pincers to dramatize battle strategy and tactics. (Courtesy Robert M. Chapin and *Time* magazine)

sickles added clarification and action to the maps. Such maps have been variously designated as "active maps," "dynamic maps," and "suggestive maps." (Fig. 10) Most Chapin maps are on conventional projections (although without parallels and meridians), and the majority are north-oriented. When the wartime interest shifted to the Pacific area, he made more frequent use of globular and perspective maps, with orientation from various viewpoints.

Although Chapin's work predominated in *Time* during World War II, several other cartographer-illustrators also prepared maps for the magazine. Eight colored pictorial maps prepared by Aldren Watson, Antonio Petruccelli, and Ernest Hamlin Baker were published in successive issues in the latter half of 1940. They were designed to "introduce a new technique in cartography, created to help people understand the military movements of air and naval fleets, armies, and populations in actual and potential theaters of war all over the world. . . . On each map everything unessential has been stripped away to emphasize the militarily important physical features." Each map was inserted as a center spread in an issue of the magazine, and the pages were unnumbered. The series, with text, was assembled and published, in 1940, as *Time's Atlas of the War*.

The end of World War II witnessed a numerical decline in *Time* maps. Those which were published were less dynamic in style and symbolism than the maps which charted the course of the war. Peacetime journalistic maps, published in 1946, included pictorial-economic representations of the Philippine Republic (July 8), and Portugal (July 22), a map of Central America titled "Under One Flag" (Sept. 30), and "Taming the Mo" (July 29), a map of the Missouri River Basin. On the maps of the Philippines and Portugal, touches of red were added to some symbols.

The year 1947 was relatively peaceful. *Time* maps during this year illustrated reviews of books about World War II, pictured the extent of Standard Oil holdings throughout the world, charted the "Atlantic Divide" in blue tints, traced the destructive path of hurricane "Emma," graphically pictured the topography and resources of Mexico, Alaska, and Oahu, delimited Chicago's "Tribune Land," and presented the domain of New Orlean's Mayor deLesseps Morrison. Internal difficulties within the borders of the new India were pointed up by depicting the different states and principalities as parts of

FIGURE 11.—India's confusion of States is presented in a jigsaw puzzle on this Chapin map. (Courtesy Robert M. Chapin and *Time* magazine)

a jigsaw puzzle. The map carried the terse title "Pieces of Hate." (Fig. 11)

Communist expansion in Europe and Asia, the "Cold War," and the Berlin airlift, newsworthy and mapworthy events of 1948, were appropriately portrayed by cartographer Chapin. Almost all the maps included red tints or overprints. Economic-resource maps of Louisiana, the Netherlands, and Rumania illustrated background stories of these regions. Increasing attention was given to map titles, with designations such as "Operations Vittles," "Juliana's Garden" (i.e. the Netherlands), "Puppet Pauker's Province" (Rumania), and "Guns Over Greece." The snappy title trend hit a high (or low) point the following year with "Trippe Around the World," for a map of the Pan American Airways system, and "Mr. Mellon's Patch," for a plan of Pittsburgh and its "Golden Triangle."

A story on world domination in the January 8, 1950 *Time*, featured three large multicolor Chapin maps, titled respectively "1900-Brittannia's World," "Two World's 1950" (picturing U. S. and Soviet spheres of interest), and "Three Faces of Europe" (1914–18, 1939–45, and 1950). The first was drawn on the azimuthal equidistant projection, centered on the United States, and the others utilized the orthographic projection. This series of maps, representing a major forward step in newsmagazine cartography, was prepared to show "a few of the results of [the world's] convulsions" from the vast social and political earthquakes of the first half of the twentieth century.

The years 1950 and 1951 brought war in

Korea, and Chapin dusted off his martial symbols to picture the ebb and flow of military actions. Once more *Time* maps were decorated with "flaming fronts," and bomb bursts, and squeezed between the jaws of C-clamps.

In 1952 the world again enjoyed relative peace, and the newsmagazine cartographer had more time to prepare background maps. Chapin responded with a succession of colorful maps picturing the world of Islam, the Soviet contact with the Middle East and South Asia ("Southern Exposure"), "Asian Rimland," "Europe From Moscow," and "Asia from Irkutsk." The last two, in perspective with unconventional orientation, were somewhat suggestive of Harrison-*Fortune* maps.

Other attractive colored maps, in 1952 and 1953, illustrated stories on Sao Paulo, Brazil, Bolivia, and the province of Alsace, along with a map showing the "Provincial Heritage" of western Europe. More colored maps were features in *Time* issues during 1954 and 1955, in addition to a number of sketch and pictorial maps. A story on "Imperialism" in the May 17, 1954 number was illustrated with four page-size full color maps. All the maps, prepared by Chapin, were on azimuthal equidistant projections, and pictured respectively the "British Commonwealth," "French Union," "Spain & Portugal," and "Netherlands, Belgium, Denmark & the U. S." The July 26, 1954 number included a full-page, colored, pictorial map of Indo-China by another *Time* cartographer, J. Donovan.

Chapin dramatically presented the geography of "Red China" in a series of three maps in the April 18, 1955 issue. A perspective, colored, relief map of Communist China and her neighbors occupied a double page. A second, single-page map showed Formosa, separated from Red China by Formosa Straight and the U.S. Seventh Fleet. "Hub of Asia" was the title of the third map, which was centered on Peking. "Manila Pact Signatories" and countries "Protected by Manila Pact" were set off by common colors. The expansive ocean sweeps were shown in black as a background for the bright colors used on land areas.

An article on the Middle East provided inspiration for *Time's* and Chapin's most ambitious map project (August 20, 1956). Eight pages of four-color maps were used to present "a concise review of more than 3,000 years of history, covering the rise and fall of ancient empires and modern colonialism around the rim of the Mediterranean." Planned some months before, publication of the maps in *Time* coincided with Nasser's seizure of the Suez Canal, and the Israeli-Egypt conflict.

In commenting on this significant contribution to journalistic cartography, publisher James A. Linen noted that "conventional historical maps usually show only one point in time, but *Time's* R. M. Chapin Jr. managed to encompass broad spans of time in his maps and yet keep them easily readable. His Roman map, for instance, ranges from the time of the Punic Wars through Constantine, and his Islam map from Mohammed to the last days of the Ottoman Empire." Linen gave a hint of the work involved in preparing such a map series in reporting that a geographically-trained *Time* researcher spent three months compiling historical dates and data for this special feature. The South Pole was the theme of two full-color page-size Chapin maps in the December 31, 1956 number of *Time*. Prepared to illustrate a feature story on Dr. Paul Siple and the Antarctic program related to the International Geophysical Year, the maps showed the "Conquest of Antarctica" and "Antarctica 1957."

After Chapin transferred to *Time* in 1937, there was a brief period during which maps appeared only infrequently in *Newsweek*. World news in the late thirties and early forties, however, could not be adequately reported without maps, and *Newsweek* shortly engaged new cartographers. Until the early part of 1938, maps in *Newsweek* were unsigned. They consisted, for the most part, of small sketch maps printed in black and white, or gray. They showed little originality, and several followed the unfortunate practice of using the Mercator projection as a base.

About April 1938 *Newsweek* maps began to show more character and a definite improvement in quality, with the addition to its cartographic staff of Frank Manning. Topography was a welcome feature on many Manning maps, and some were enlivened with pictorial symbols. Manning maps are lighter in tone than those of Chapin, with a more restrained use of solid black.

In its July 11, 1938 issue, *Newsweek* printed a full-page Manning map of the Far East. The map was drawn on the orthographic projection and was printed in brown. As the need and demand for more maps increased, other cartographers were engaged to assist Manning. The byline "McLaughlin" first appeared on a *Newsweek* map in October 1938. After America entered World War II, maps were also prepared for the newsmagazine by Browne and Marc Fore.

In 1944 *Newsweek* published *Global War 1939–1943, Four Years of World Conflict.* It included summaries of events during each of the four war years and 24 *Newsweek* maps prepared by the above-named cartographers. Most of the maps in the booklet showed background or historical data, although several traced movements and lines of major battles and campaigns. The maps were black and white, with red overprints, and all were conventional in layout and orientation. Regrettably, the Mercator projection was used for some maps of the world as well as of Europe.

Newsweek's Global War Atlas, also published in 1944, presented enlargements of eight strategic war maps, prepared for the magazine by Marc R. Fore. Three were on the orthographic, three on the conic, and two on the azimuthal equidistant projection. The maps, in black and white, had arrows, symbols, and defense lines overprinted in red.

During the last two years of the war, 1944–45, most *Newsweek* maps were prepared by De Moreland, with some assistance by Stone. In the immediate postwar years, 1945–49, the principal cartographic assignments for the magazine were handled by James Cutter who received his training under Chapin. Cutter's maps show a greater degree of originality than do those of most of his predecessors, and this was, cartographically speaking, one of *Newsweek's* more productive periods.

For the past six years Clyde Magill has prepared most maps which have illustrated *Newsweek* stories. The maps are carefully prepared and, for the most part, follow the style and pattern used by other newsmagazine cartographers. With the succession of cartographers who have prepared *Newsweek* maps over the last twenty years, it is little wonder that no distinctive *Newsweek* style has developed. By regular and effective use of maps to illustrate news events, this journal has, nonetheless, made a significant contribution to the advancement of journalistic cartography.

The weekly *U. S. News and World Report* has regularly used map illustrations during the two decades of its publication. No credit is, however, given to the cartographer on individual maps. In general, maps in this journal are used as background on which statistical, descriptive, or illustrative information is presented. In some instances photographs have been used in conjunction with a map, with the locale of the former being keyed to the proper location. Graphs are frequently superimposed on the face of the map. Such map-graph combinations are referred to in the magazine as "Pictograms."

The use of maps in cover illustrations is an interesting and specialized aspect of journalistic cartography. The eyecatching appeal of colorful globes and maps is recognized and appreciated by editors, and magazines in virtually every field have made effective use of cartographic covers. (Fig. 12) There are limitless possibilities and variations in this field. A reproduction of an official hydrographic chart or topographic map provides attractive color and interesting design patterns, in addition to suggesting travel or adventure. A large and attractive globe is equally effective as a background for a pretty girl or a prominent statesman on a magazine cover.

The magazines, noted above, which have

FIGURE 12.—A cover map accented a feature story on Germany in the March 1957 *Atlantic Monthly*. (Courtesy Donald B. Snyder, Publisher, *Atlantic Monthly*)

used maps most freely to illustrate stories and articles, also feature cartographic covers most frequently. Maps quite often set the stage or serve as a back drop for the person or region featured in a *Time* cover story. A recent example is a portrait of "Campaigner Kefauver" superimposed on a map of the midwestern states. Several years ago a world map was the background setting for a cover picture of Pan American Airways' Juan Trippe. An article about the Coca Cola Company, in the May 15, 1950 *Time*, inspired a cover illustration showing the world (i.e., a globe with facial features) sipping from a "coke" bottle.

A number of map covers have been produced by several of the journalistic cartographers mentioned above. Artzybasheff and Ernest Hamlin Baker most frequently employ the map theme in cover illustrations for *Time*. *Fortune* covers have been illustrated by Harrison and Petruccelli. On several occasions Robert M. Chapin, Jr., has stepped out of the inside pages to do a *Time* cartographic cover.

Use of map and globe illustrations in advertising layouts is another facet of journalistic cartography. Many of the artist-cartographers who illustrate magazine articles and stories have also introduced maps into advertising displays. This field of cartographic illustration is also one which has developed many new techniques and approaches in recent years. It is deserving of more study and attention than can be given to it in this paper.

Journalistic cartography is still in a youthful stage, despite rapid strides made in recent years. Notwithstanding this immaturity, as compared with some other branches of mapmaking, the cartographic profession as a whole has profited from the contributions made by newspaper and magazine cartographers. Not least among these contributions has been the stimulation of interest in maps among readers of general and popular periodicals. Journalistic maps have been extremely effective in introducing maps to the man in the street, and in leading him to a better understanding of world geography. Newspaper and magazine maps have also helped explain projections and to point out advantages and shortcomings of various map grids. They have revived, for modern use, such projections as the orthographic, azimuthal equidistant, and gnomonic.

Journalistic cartographers have introduced many new ideas in design, layout, color, symbolization, and lettering. They have effectively utilized air brush techniques for both colored and black-and-white maps. With such instruments and techniques they have achieved many interesting tonal variations of grays and blacks, and added interest to the latter. Personal and individualistic mapmaking has experienced a modern renaissance in the journalistic field. Journalistic cartography has served to emphasize that maps are educational tools, which can be designed to meet a particular need or to create a desired effect. It has effectively proved that maps can be "active," "dynamic," "suggestive," and "demonstrative."

Newspaper and magazine maps are usually on small scales and, on some, generalization is carried to extremes. In certain

instances cartographic qualities are subordinated to pictorial and graphical forms, with the end product being more appropriately described as a "cartograph" or "cartogram." In appraising such works, we should bear in mind that standards and specifications applicable to large scale topographic maps cannot be used for journalistic maps.

The impact which newspaper and magazine mapmakers have had upon the profession is evident in the popularity of the polar centered azimuthal equidistant projection for world maps; of the addition, to many modern atlases and geography texts, of "global" maps on the orthographic projection; and in the trend toward more pleasing colors for maps. The current popularity of globes, especially those in a "free" mounting, is also in part attributable to the interest in global problems stimulated by journalistic cartographers.

Our Public Lands

The October 1957 issue of *Our Public Lands* (Vol. 7, No. 2) contains a series of three articles which should be of interest to members of ACSM, especially those engaged in property surveying.

The articles are: "Records—Footnotes to History" for which no author is given; "The Foundation of Land Records" by Clark L. Gumm, Cadastral Engineer, Bureau of Land Management; and "From Old Records to New" by Earl J. Thomas, Associate Director, Bureau of Land Management."

It will also be of interest to many of the readers of SURVEYING AND MAPPING to know that *Our Public Lands* is a quarterly publication of the Bureau of Land Management and may be obtained from the Superintendent of Documents, Government Printing Office, Washington 25, D. C. The price is 15 cents per single copy. Subscripton price is 60 cents a year, 15 cents additional for foreign mailing.

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Is Surveying and Engineering Equipment, Available Today, Satisfactory?

(A Panel Discussion)

MR. DIX: Ladies and gentlemen, Mr. Clifford A. Thorpe, Chairman of the Instruments Division, ACSM.

MR. THORPE: Gentlemen, before we start this Panel Discussion this morning, I would like to call upon the President of the Congress, Mr. Lester C. Higbee, to introduce the Panel, and outline to you how it was organized.

MR. HIGBEE: As a previous Chairman of the Instruments Division several years ago, it has been extremely interesting to see the progress that was made this past year under the leadership of Clifford Thorpe. Sometime during the year he sent out the following letter to various engineers and engineering groups and to local and State societies. He wrote:

"The Instruments Division of the American Congress on Surveying and Mapping is planning this year to devote a large portion of its plenary program to the problems of the surveyor. It is in this connection that we ask the help of our professional group.

"Our plans call for a panel discussion on all types of equipment used by the surveyor today: instruments, chains, tripods, and so forth. This panel will be composed of qualified representatives from each manufacturer, to study and answer your questions.

"In order to carry out the plans for such a meeting, we ask that you compile a list of questions pertaining to equipment or instruments and forward to me at the earliest date, together with the name and address of the person asking the question. The Instruments Division is trying to answer the over-all question: 'Are you satisfied with the surveying equipment available to you today? Is it adequate to allow you to perform the precise layouts required today?'

"When your questions are received, they will be classified as to type and presented to the panel. The manufacturers are most interested in this survey, as it will allow them to produce equipment more suitable to the individual needs of the surveyor—or should I mention the word 'engineer'?

"We are counting on your help to complete this survey which will cover all surveyors' organizations in the United States."

A great many answers have been received to this request for information. Mr. Thorpe has spent a lot of time in analyzing the answers and has boiled them down into about twenty questions which he is going to put to the panel.

I hope that the Panel's answers can be reasonably brief, although they should be adequate, so that there will be time for discussion from the floor.

The purpose of this committee is to get down to what we call the grass roots or the bread-and-butter surveyor, the man who is doing this work every day for a living, you might say, and we want him to be heard, because, after all, he probably represents the greatest volume of business to the manufacturers; and it is their endeavor to serve that man who perhaps has the greatest need and yet has the least opportunity to express himself as to his requirements.

With that introduction, I will now name the Panel.

We have present Mr. Chikofsky of the Precision Instrument Company; Dan Harkness of W. & L. E. Gurley Company; "Doc" Price of Eugene Dietzgen Company; Mr. Benjamin of the Lufkin Rule Company; Mr. Davatz of Kern Instruments, Incorporated; Mr. Waldenburg of the David White Company; Mr. Bean of C. L. Berger & Sons; and Ward Bolter of Keuffel & Esser Company.

Presented at the Seventeenth Annual Meeting of the American Congress on Surveying and Mapping, Washington, D. C., March 6–8, 1957.

MR. THORPE: Thank you very much, Mr. Higbee.

As Mr. Higbee has outlined, many of these letters were sent throughout the United States to different surveying and engineering societies. They have conducted meetings within their own groups and have come up with certain suggestions, ideas, or little things that they would like to see changed or manufactured, that might make their job a little easier or a little bit more proficient today.

I will read these questions and the Panel will give you their answers to them, and then we have two microphones that can be moved through the audience. If you will raise your hand, one of the persons handling the microphones will come to you. State your name and question. Try and direct it to the member of the panel that you would like to have answer your question.

In other words, if it had to do with tapes or chains you have two representatives up here, either Keuffel & Esser or Lufkin Rule. Other instruments are represented by Kern with Mr. Davatz, and Precision Instrument by Mr. Chikofsky.

The first question: "Are there any advantages in using a round steel wire rather than a steel ribbon for measuring tapes today? Have any manufacturers given any thought or study to the question of wire versus steel ribbon for manufacturing tapes?"

I shall direct that to Mr. Benjamin of Lufkin Rule Company.

MR. BENJAMIN: I am not aware of any consideration being given to a round steel wire for measuring. It would appear that what is desired is to avoid wind resistance, to get down to the least wind possible. There are tapes in the industry an eighth of an inch wide and about 0.025 thick. From a cross-section standpoint it would approximate a wire. I personally do not see how it would be practical to graduate a wire and still have it legible and durable. Possibly a sleeve of some kind could be applied.

MR. THORPE: Thank you. The second question is: "It would be a great help and time saver for those of us who measure tension when taping to have a combination hand grip and tension scale. Is any manufacturer planning to make such an item of equipment?"

I would like to ask Ward Bolter to give the Keuffel & Esser answer to that; followed by Mr. Benjamin of Lufkin.

MR. BOLTER: I think we can answer that by saying that we have had that type of a tension handle listed as a regular catalogue item for a great number of years. The difficulty is that the tension handle then becomes an integral part of the tape. You cannot buy a separate tension handle which will have those features, and apply it to any tape that you may pick up along the line. It has to be calibrated to the tape and this becomes, as I said, an integral part of the tape because the zero part of the line is part of the tension handle.

MR. BENJAMIN: We have heard requests for something of this kind for several years. We have given it quite a little consideration without any tangible results that are worthwhile at the moment. Just yesterday there were some suggestions made to us—to our group—that appear to have practical application. It is my hope to go back to the plant, to our engineers, and discuss it more thoroughly. We would certainly welcome any suggestions that would help us in endeavoring to correct this condition.

MR. THORPE: Thank you. The next question: "The Johnson Elevation Meter shows some promise of reducing the field work required to obtain supplemental elevations. A similar machine for determining the distance and direction of traverse courses would be of great advantage. Is any manufacturer working on equipment along these lines?" Starting at the far end of the table. Mr. Bolter?

MR. BOLTER: At the present time I will have to avoid that question by saying that we are not working on something along that line. We would very definitely be interested.

MR. HARKNESS: I will have to answer in the same vein, that nothing has been done on that. We are always interested. That is about as far as I can go on that.

MR. PRICE: My answer will have to be the same as Mr. Harkness'.

MR. THORPE: We are getting an unanimous decision here. Skipping over now to Mr. Waldenburg of David White Company.

MR. WALDENBURG: We have nothing along that line.

MR. BEAN: It looks like you draw a blank on that one. The same answer here.

MR. THORPE: Thank you, gentlemen. This next question might get us into a little bit of discussion. As we go through the panel, I would like the members to keep their remarks as brief as possible. "Such things as optical-reading theodolites, pendulum type levels, snap-on tribrach for interchanging instruments and signals on tripods, all can be obtained through foreign instrument companies. Why don't U. S. manufacturers produce these items?" Now start down at the end with Mr. Chikofsky.

MR. CHIKOFSKY: Actually, Mr. Thorpe, you directed the question to the American manufacturers of instruments. You did say that the foreigners do make them. So, I think I had better pass to Ward Bolter and let him give the answer as to why the American manufacturers do not.

MR. BOLTER: A couple of manufacturers are working along that line. We have self-leveling levels, and things of that sort. As for the snap-on tribrachs, and one thing and another, take a look at the old transit made back in 1831 by an American manufacturer, and I think you will have the answer to that.

MR. HARKNESS: I do not have much to add. I think that when these are universally adopted in the general field of surveying, American manufacturers are really going to go along with them. There are, of course, questions that have to be answered about that type of equipment, as far as surveyor-engineer is concerned. Is he at a place where he can obtain repairs in a hurry? The American engineer is faced with that problem more so probably than any other group.

MR. PRICE: I think part of the difficulty, of course, is due to our present high wage scale, which is an aspect that we all face here in competing with foreign industries.

I think all of the instrument manufacturers are working on some modifications of some of the features that we find in the foreign instruments. But when we try to get down to competing with them in price, we have to think in terms of mass production.

MR. WALDENBURG: Regarding the optical-reading instruments, I concur completely with Mr. Price, because it is obviously the wage scale difference between this country and foreign countries. We happen to have an instrument which has a tribrach head. It is an experiment on our part. There is an attempt on our part to modernize the American instruments.

We also have a self-leveling attachment which is applicable to most instruments on the market. Both of these are experimental so far—not experimental, exactly, but they are innovations on our part, with the various reactions in the future. I think it will influence the rest of the manufacturers, according to how well they are accepted.

MR. BEAN: We have a model which we played with. As one of the other fellows has just mentioned, it is a case of the labor required, which brings the price to a rather prohibitive point. We are in doubt as to whether the average American surveyor will accept it. That is the way we stand with it right now.

MR. THORPE: Next question: "Years ago we were able to obtain a narrow light chain which was marked with rivets. The chain was a much finer chain than we are able to buy today. Would it be possible to have such a chain manufactured today?" Again, Mr. Bolter, first, for K. & E.

MR. BOLTER: It would be possible to have it manufactured on special order. But I am quite sure that Mr. Benjamin from Lufkin, and the other tape manufacturers, will agree that the demand for that type of tape or chain was so limited that that is why all of us discontinued it.

MR. BENJAMIN: I am very much in agreement with Mr. Bolter's comment. I might just add this: The minute you put holes for rivets in a fine piece of steel you are weakening it. I would question its ultimate durability. I wonder if that isn't why they were discontinued in the past. Also, can

you get the precision you are attempting to get today with a rivet, which is not too definite a marking? There are constant requests for finer definition of the graduations. But primarily I would question the weakening of the tape by punching it. To my knowledge, I do not recall Lufkin ever having made a riveted tape.

MR. THORPE: Thank you, sir. The next question: "Would it be possible to get a plastic or plastic-coated leveling rod which our group feels would overcome deterioration of present rods when they are used in water and under other severe conditions? We would also like to see a lighter rod with a broad reading face." Are there any improvements underway along these lines? Now Mr. Bean of Berger. For a change we'll start at this end of the table.

MR. BEAN: I do not know how to answer that for you. Anything is possible. Certainly there would be no difficulty in making a rod lighter. I wonder if it was intended that the rod be of hollow design and of metal in preference to wood. I think a lot hinges on that particular point. There is no limit to what we can do in the way of lightness, and the broader face is no problem. Again, it is just a case of pioneering with it and will it be accepted, if we make it?

MR. WALDENBURG: When they refer to plastic coatings, what are they referring to?

MR. THORPE: I think what they have in mind is a type of rod which I understand is on the market today. In other words, our normal rods have either a painted wood surface or a painted steel band. What they are looking for is a type of plastic covering on the rod in which the actual face is made of a strip of plastic which does not scratch and come off like the normal painted surface of a rod does, and does not rust out as readily when it has to be used around coastal or other salt water areas.

MR. WALDENBURG: I can make no comment on that at all. As Mr. Bean said, anything is possible. I am not the engineering department.

MR. PRICE: Well, we have been experimenting with glass and making the whole rod out of glass, changing the cross-section of it, and giving it a broad face. But so far we are probably several months away from it. I am not smart in telling K. & E. what we are doing here.

MR. HARKNESS: Perhaps I was thinking in terms of protection for the wood; that is, some of these plastic coatings that are now on the market for protecting the wooden portion of the rod, keeping it from changing or absorbing moisture and changing dimension.

We are always confronted in changing any surfacing or finish that we put on a rod with whether light, or perhaps even absence of light, will affect the coloration of that plastic coating that we might use for protecting, you might say, the wooden portions. That was the idea I had in mind when the question was first posed. I wasn't thinking so much of the plastic type of graduation. If it is a wooden rod, there still is a possibility of obtaining some sort of coating, but the coloration of the rod would have to be explored.

MR. BOLTER: There are practically three questions involved. Let's consider the weight; two, the material out of which the rod will be made; and three, the graduated face of the rod.

As far as weight is concerned, we can go into light metal. You have difficulty with light metals. A rod will bend, it can be dented, it won't slide, and then you send it back to the factory and say "I received it that way."

Wood has the unfortunate characteristic that seasonlly it gets longer and shorter, and when you use a rod under water, as some people apparently do, it swells and then it won't work, the clamps won't slide and one thing and another like that.

As far as the graduated face is concerned, we are doing a lot of work. Thanks to "Doc" Price, for he has given me a couple of leads now on what Dietzgen is doing. We are also working on synthetic materials. I won't mention names, as to which ones they are. But we have been, because we don't want to have most of our rodmen, when they extend a metal rod up to a high tension wire, electrocuted. So, we want something reasonably nonconductive when

dry, and also reasonably stable. We would have graduations readily visible over long distances, permanent in their nature, and easily replaceable.

MR. THORPE: Thank you. Next question: "Manufacturers could provide a more comprehensive manual with their instruments giving more information on their instruments."

Now that question came in from the field and it is rather vague the way that it has been stated. I think, if I remember correctly, it was a middle western group that sent in this inquiry. I think what they had in mind was sort of a field manual, giving them certain steps that they might follow, such as peg tests and so forth.

With that in mind, we will start with Mr. Bean of Berger.

MR. BEAN: I do not think very many have seen the Berger Instruction Manual. I think it is about as complete as anything you could possibly put with an instrument, including peg tests, method of disassembly, recommendaions for cleaning the circle, and field first aid on the cleaning and reassembly of centers. All I can say is that it certainly is as complete as possible to put out, aside from publishing a full textbook.

MR. WALDENBURG: We believe with the types of instruments we are discussing here that certainly the gentlemen using those instruments are qualified. It should not be necessary for us to give them a textbook on an instrument of that type and its use. We believe it is a function of a manufacturer to service and repair the instrument. That is why we have not included anything further.

MR. DAVATZ: I would say that with European-type instruments, as far as my company is concerned, we furnish some special manuals which are written in this country for the particular use of the American surveyor.

Maybe one thing we do not do is to tell the people how to take the instruments apart. We tell them not to.

MR. THORPE: That is a good thought. Now Mr. Price?

MR. PRICE: We question just how far a manufacturer should go in writing up how to take an instrument apart in the field. We sometimes think that, perhaps, that should be left to the repair department. We give more complete fundamental instructions with our Builders' Level, and I presume we should carry it over to the higher instruments. But we feel that we are talking to a different group there, and the instrument is much simpler. Perhaps we should examine the instructions and make them more complete.

MR. HARKNESS: I think we are between two fires. Those groups of surveyors and engineers who say we do not want our men tc touch any instruments. They are to leave them alone; keep their hands off. Perhaps they are wise, I don't know.

Then there is the other that wants a complete servicing manual. I think we have been trying perhaps to follow a middle road and give them enough so that they can make the ordinary field adjustments and do field servicing without, you might say, doing too much damage to the instrument.

You find that some people, out of curiosity, will go further than they are supposed to. Where can we draw the line? It is certainly the curiosity that killed the instrument, in this case. Some of them go too far, and under wrong conditions of servicing and cleaning they end up in a worse position. We try to bring out the things that they can do and handle themselves properly and warn against certain things.

We, of course, are always open to suggestions as to what should be included in any manual.

MR. BOLTER: From the standpoint of K. & E. Company, I am in accord with everything that has been said so far. We give a reasonable amount of instruction on how to field-service an instrument if it is necessary. The average man would be better advised to let a specialist do any important servicing. The man who is out in the field, up in the North country or some other faraway place, is on his own. He may have to do things that the local man can have done by the local service shop. For many it may be necessary to have a more complete instruction manual.

Mr. Moderator, I would like to ask a question from the group. Recently we have

been receiving a tremendous number of inquiries for instructions on how to train instrument service men. Is there any particular reason for that? I do not think it is the function of the manufacturer to train instrument service men and repair men.

MR. THORPE: I think he is taking bread right out of my mouth.

I think what Ward has in mind is possibly that people in the far parts of our country who are a little far removed from railway service or railway express, take responsibility for repair. I think possibly questions like, "How do you get level?" and "How do you put them on?" and such things are what he has in mind. A lot of times we get fellows who lose a screw on a standard or who want to get a standard cap—and if he gets it in, how in the Sam Hill does he adjust his instrument when he gets through with it?

That can go on and on. So, we will get back here and I will ask Mr. Chikofsky.

MR. CHIKOFSKY: As last man on the panel and low man on the totem pole, with regard to this question I have to go along with the rest of my colleagues here, especially Mr. Waldenburg of David White Company, wherein he said that their company, and every company that manufactures instruments, takes the stand that the majority—I would say 99 per cent of the users of the instruments that are manufactured today—know pretty well how to use their instruments. A book of instruction is superfluous, and, of course, we who manufacture a foreign line of instruments know that the American manufacturers are trying to conserve in their costs. However, we feel that some type of booklet must be issued with instruments. Not a text, but a general outline, as to the capabilities of the particular instrument in question and without going into too much detail.

With regard to servicing, it is well to make minor adjustments in the field. But we like to insure that the instruments that we manufacture—and those of every other manufacturer—will not be ruined to the detriment of the instrument by the user when he tries to exceed his limits in the field. We feel that in that guise we like to limit the type of booklet that is necessary to go along with each instrument.

MR. THORPE: Thank you.

I understand that the floor mikes are ready now. What I would like to do is stop the so-called questions for the moment and entertain questions from the floor. I see Professor Kissam out there looking at me. Professor, what comments do you have to throw at these boys up here?

PROF. KISSAM: Thank you very much for giving me the opportunity. I spend my time thinking about instruments. Whenever you think of instrument improvement you find that the man in the field is probably the most conservative man in the world, and I am saying that advisedly.

The average surveyor is the most conservative man in the world. He thinks that what he has had is perfect. When someone wants to make a change in an instrument, he says, "Not for me." The best story about that is the Gurley. Gurley made a level a hundred years ago, I suppose, that took the railroads across the country. They bought that level by inches of length of barrel. Still Gurley has the exact same instrument, not because they particularly want to, but because they darn well have to.

I rather think it is the fault of the surveyor rather than the instrument maker that we do not have faster improvement of instruments in this country. I suggest that any surveyor that has a really good idea should send it in and see what the instrument makers will do for him.

MR. THORPE: If you will, state your name, please, for the recorder, and the section from which you come.

MR. REYNOLDS: My name is Reynolds. I am from the State of Connecticut. My question is three-pronged. Do you prefer me to ask one prong at a time?

MR. THORPE: By all means.

MR. REYNOLDS: All right. The first question is with regard to the difficulty we have as a result of receiving tapes from the manufacturers with no notation of the proper tension to be applied in using the tapes when supported only at the two ends. The manufacturers are experienced, but

seem hesitant to give us that. The result is, we must send our tapes to the Bureau of Standards. I think that the manufacturers should give us that information. I am eager to know why they do not.

MR. THORPE: Mr. Benjamin, would you answer that?

MR. BENJAMIN: I heard the question plainly. It is not easily answered. I think there is quite a little agreement on that.

The various tape manufacturers do put in their catalogs some very broad, rough statements as to approximately the tension necessary to make accurate measurements when supported at the ends.

No two tapes are identical, even though they are made at the same time and under the same conditions. There is apt to be a slight difference in the chemical analysis of the steel or in the quality of the steel one way or another, and I will state that we are extremely critical as to the quality of the material we buy. But with all of our care, there are these slight variations.

MR. REYNOLDS: The second prong has to do with the need of tripods suitable for supporting sight rods. I have been curious to know why manufacturers do not provide us with a simple tripod designed to support the sight rod.

MR. THORPE: Will any of you members in the panel undertake to answer the second prong of this question?

MR. DAVATZ: I can answer this question with a simple, very short answer: we make them. You will hear from me. (Laughter.)

MR. REYNOLDS: The third prong has to do with optical plummets. It appears to us who are working out on windblown summits that our American manufacturers have been very slow in providing us with a substitute for the swaying plumb bob.

MR. THORPE: My answer to that is, before I turn it loose, somebody is in for a little free advertising around here.

MR. WALDENBURG: We make it.

MR. BEAN: We make one also.

MR. THORPE: There are two. I know Ward Bolter makes one.

MR. BOLTER: You used the term "optical plummet;" do you mean optical plummet or plumb bob?

MR. REYNOLDS: I mean any means of setting an ordinary, conventional transit, without the use of a plumb bob.

MR. BOLTER: And as you level up the instrument it will still be centered over that point, just as a conventional plumb bob, except you want it to operate optically and not be plagued by the wind.

MR. REYNOLDS: I am not going to specify, because the instruments which were used, which are equipped with optical plummets, have to be leveled before the plummet is useable. It wouldn't make any difference, I think, to most surveyors, as long as they had a means of centering the instrument. I do not believe it should be necessary to buy that as separate equipment. I think it should be an integral part of an instrument, if it is available.

MR. TROWBRIDGE: F. J. Trowbridge, Waterbury, Connecticut.

Mine is not so much a question, but rather remarks on some of the statements of the manufacturers. I will go through my notes and pick out the ones I would like to comment on.

The question of graduating tapes by rivets or some small pieces of metal attached to the tapes, probably by rivets. Those things are obstructions in the use of a tape. Anybody who uses the tape to any extent knows that the efficient and speedy use of a tape is very often impeded by catching it in all kinds of things, between two rocks, two small stones, in a tree, or an infinite number of other obstructions. I think that is a pretty good reason why tapes with attached graduations are not made. I know I wouldn't buy one.

In regard to plastic-coated level rods or where the face of the rod is made more permanent, I believe that the question maybe resulted from just that need. What is the supposed life of a leveling rod, a tape, or, for that matter, anything that is used in the field. Durability is certainly one advantage to any piece of equipment or tool that is manufactured.

The question is, how long do you expect the tape or the leveling rod to last? It depends all together on the kind of use to which it is put. If it is used under water

it will deteriorate much faster than if used on dry land. I recall that I have seen in our exhibit hall a level rod—I don't remember who the manufacturer was—but it impressed me very favorably. The face of the rod was made on some kind of plastic material. The graduations were embossed. It seems to me that that manufacturer who turned out that embossed rod made a very good rod, very much better than those which were simply painted.

MR. MARCH: My name is March. I come from Nova Scotia.

Sometimes a tape breaks within a few inches of the end. I am speaking now of usage where tension springs are not used. It would be advantageous to have both sides graduated on the first and last foot. I wonder if this has been considered, or if there is some prohibitive reason why it is not done?

MR. THORPE: Mr. Benjamin, did you hear the question?

MR. BENJAMIN: The first and last foot of a tape be graduated; is that correct?

MR. THORPE: On both sides, sir.

MR. BENJAMIN: On both sides?

MR. MARCH: That is correct.

MR. BENJAMIN: I have heard that brought up this past week. I have said that it possibly could be done on special order. It would add substantially to the cost. But it is not impossible to do. It might lead to some production difficulties, but, basically, I would say that it possibly could be done on special order until such time as there was sufficient demand to justify it as a standard product.

MR. SCHOFIELD: Schofield, from Cape Cod. I am interested in several things in industry. One is the tension handle. It was touched on briefly. I find that a lot of engineers and land surveyors are interested in a tension handle that will measure up to fifty pounds. I know that such a tension handle has been available, but it is quite a trick to get hold of one, and the cost is almost prohibitive. I think there are enough engineers who want such a tension handle that it would be worth while to put it in the catalog so that we can find it and use it. Will someone touch on that, please?

MR. BOLTER: I can't quote the catalog page number from memory, but it is there, and it goes up to sixty pounds. It is a good, substantial fish hook. It is not a precise instrument, but it will give you approximately the tension that you want when you are using a 300-foot or anywhere up to a 500-foot chain.

MR. BENJAMIN: We will endeavor to include one in our next publication. I say we will endeavor to. They are available on special order at the moment.

MR. SCHOFIELD: I would like to just add that the matter of tension is quite important. For 200- or 300-foot tapes, a matter of a pound gives a considerable change in measurement, so that the fish hook is probably not quite sufficient for a surveyor in his accurate work.

MR. STADT: Stadt, of Grand Rapids, Michigan.

Relative to giving the field man information as to how to use the instrument carefully. I would like to comment that if I buy an automobile they will give me full instructions as to what oils and grease to use in the various moving parts.

Now, in the instruments that I have been acquainted with, there are a few manufacturers that do provide a kind of oil, with no comment as to where it should be applied, and my question is this: Shouldn't the manufacturers consider the proper use of that instrument in various locations, concern themselves with the climatic changes, and provide more comprehensive information as to how to properly lubricate that instrument?

MR. CHIKOFSKY: With regard to the proper lubrication and inclusion of a vial of oil with the instrument, we are going back to the basis of the type of service that should be done by the user. I know with regard to our instruments—of course I can only speak for them—we provide the instrument without a can of oil for it. But the lubricants that we use will withstand climatic changes ranging from minus 70 to plus 240 degrees, and will stand anything that the surveyor himself will go into.

MR. HAMILTON: Hamilton, of South Carolina.

Pursuing the question of tension on the end supported tape, would the manufacturer furnish a figure for an individual tape?

MR. BENJAMIN: I do not know. I cannot give a comprehensive answer on that at the moment. We have some equipment for that purpose. I think possibly we could. We would obviously prefer an avoidance, because we defer to the Bureau of Standards on a thing of that kind where practical.

However, that is something that is being investigated and not just from this moment. It has been under discussion at the plant for some little time.

I believe possibly we could. Whether there would be a modest charge for that, I don't know. There might be.

CAPTAIN READING: Reading. I wonder if it would be possible for the Instrument Division to vision in future Congresses having some good, strong columns or monuments and make the arrangements, so that surveyors who are interested can take the instruments out, the new instruments on display, and actually finger them themselves. The manufacturers to have a man present at all times to see it wasn't dropped or something.

I have noticed in Europe that very often at the surveyors' meetings they make provisions for a number of stands either in the basement or somewhere with collimators on good, stout stands. I believe there would be a lot of interest in actually fingering an instrument, looking through it and comparing different instruments as to their optical qualities and performance.

MR. THORPE: I think that is a very well-placed suggestion, and as Chairman of this Division I have made a note of it. It is something that I will have to discuss with the manufacturers to see if something like that could be arranged. I know that at some of our local meetings throughout the individual States such systems have been used very satisfactorily.

In other words, what you would like to do is to be able to run a low field check on an instrument that you might have a particular interest in. Am I correct, sir?

CAPTAIN READING: Yes sir.

MR. STEVENS: Kenneth Stevens, of Michigan.

How often is it advisable to send a transit back to the manufacturer for cleaning, even though it remains in adjustment?

MR. THORPE: Well, that is a good question. If we let the manufacturers loose with a couple of big repair firms in here, we will let them in on it too. Do any of you panel members care to answer that?

MR. BOLTER: Cliff, I think you are better qualified to answer that than any of the manufacturers.

MR. THORPE: I would like the microphone handed to Mr. George Green Moore, President of Surveyor Service, Los Angeles.

MR. MOORE: Thank you very much. The question is a difficult one to answer, primarily because you ask how often should a transit be cleaned and adjusted. That depends on where and how it has been used.

We have seen instruments that have been in the field for months, and months, and months that will perform perfectly. By the same token we see transits that have been used on construction, in tunnels, in coal mines, that sort of thing, that should be cleaned frequently, almost every week. In some cases they should be cleaned daily, depending on other use. So again I say it is a very, very difficult question to answer and answer honestly.

MR. THORPE: I think what the gentleman would like, George, is a rule of thumb for an average surveyor.

MR. MOORE: Under those conditions, our rule of thumb is to tell our people in our locale that an instrument should never go longer than a year—frankly we would prefer to see them come in more often—because we believe that the amount of money expended in service will give real returns to the engineer in the use of his instrument.

MR. EVANS: I didn't ask for it. But the impression I got—and I hope I am not thrown out if I am wrong—was that on this basic question of development and research for improved ideas and new developments in the industry's instruments, the manufacturers have given the impression to me that if somebody wanted and showed them how

to build it, they would build it for them and sell it to them.

I would like some comments about who is responsible for the basic development and research in instruments and instrument design and new improvements in instruments.

MR. THORPE: I think that, in order to give the panel a fair shake here, they should know that Mr. Evans is an expert with the Geological Survey. Would any member of the panel care to challenge him on that question?

MR. BOLTER: Let me try. I think many of the good ideas come from the people who are using our instruments. The final design, the engineering and such is part of our function. We try and sit back in our little ivory tower and dream things up. Sometimes they work and sometimes they don't work. But it is from the men who are in the field who are using the instruments, that most of the practical suggestions come. They may not all be the type of suggestion that you can develop into a finished design, but it certainly gives us a lot to think about, and we are doing a lot of thinking. I believe the rest of the manufacturers are too.

MR. DAVATZ: I would go along with Mr. Bolter in that respect. The man who was responsible for the major developments in the optical surveying instruments was the man who came from the ranks of surveyors, Dr. Henry Wild.

I would like to comment further in that I think a distinction should be made between basic changes in design and practical adaptations to certain requirements in the field. Some manufacturer may come up with an idea which will vastly improve an instrument, which may come out of the field of science and field use.

Of course there it is a matter on one hand of mechanical engineers, optical engineers, physicists, and what have you. On the other hand, these ideas have to be compared and studied with the field requirements; for which the comments of the surveyor are absolutely necessary.

We can design a beautiful instrument that performs in every respect as far as scientific measurements are concerned and it may not be good in the field, because there are certain aspects in it which may be lacking.

So, I think it is the duty of the manufacturer on the one hand to look out for himself for improvements that he knows of and maybe to broadcast them, letting them be known to the public. On the other hand, that he be in touch with the actual user to find out what his requirements are. I don't think anyone can afford to be on his own.

MR. THORPE: Dr. Price, we certainly appreciate your contributing to this discussion this morning. Dr. Price has a plane to catch, and he certainly is excused.

Mr. Davatz, one question here that I want to ask you has come in several times: "Could information on field adjustments of optical type transits or theodolites for line of collimation be supplied by manufacturers?"

MR. DAVATZ: When it is feasible, these instructions are contained in the Instruction Manuals. But where it is not feasible, for one reason or another, based on past experience, such instructions are not there. In such a case, it is very seldom that any adjustment is necessary. If it is, it is something for a specialist.

MR. THORPE: Do we have other questions from the floor? If not, we will continue with some of the questions from the field.

"A lot of talk goes around that automatic or self-leveling levels are affected by low temperatures. Could one of the manufacturers clear up this question?"

MR. BOLTER: I would say that with any leveling instrument you have to take into consideration temperature. It depends upon the range over which you are operating and the adjustment of the instrument. That is true of our self-leveling level. I can't vouch for any of the others, because we have not had experience with them yet. But we expect to have some soon. There is a basic adjustment that should be made, if the instrument is going to be used normally under extremely low temperature conditions.

MR. THORPE: Professor Kissam, you are an expert on this heat transfer. Have you any comments to add to that? The reason

I am going into this question a little deeper is that it has come in approximately forty or fifty times.

PROF. KISSAM: The question of temperature in leveling is a very serious one, there is no doubt about it. The level is very much affected by temperature. Although it doesn't show up so much, because you don't expect so much of it. There is one thing that is dead sure, and that is if any automatic level is leveled carefully under rough leveling, there will be no trouble with the adjusting.

The wonderful thing about the automatic levels, as I see them, is that they put on the last little bit automatically. You can't expect them to put the whole correction in there. I suggest that anybody who has an automatic level who wants to do very precise work with it should level that instrument carefully, with the rough leveling device, and keep that rough leveling device in good adjustment. If that is done, much time will be saved and still maintain the high accuracy so that the whole operation is well worthwhile.

I would like to point out one thing about a spirit level, because I think we keep forgetting it. A spirit level has in it an extremely volatile liquid, it must, or it won't work. This liquid always has a high vapor pressure. A vapor pressure is not like a gas pressure. It is a case of the molecules leaving the liquid and kicking the liquid back as they leave. They work something like jet propulsion.

If there is a temperature difference in it, the warm end of the bubble will be kicked away from the gas area toward the other end. As it kicks, it gets into a warmer place still, the kick continues and the bubble moves toward that warmer end, until gravity takes effect and it moves back.

Now that incipient condition is always true in every spirit level. In fact, the spirit level will act like a heat engine. If you put a very sensitive level in a hot place it will actually be a heat engine. That incipient condition in the spirit level creates a great deal of difficulty. It often isn't realized.

For that reason it is not taken care of. I think the answer to that question fundamentally is that spirit levels and pendulum levels must be treated in accordance with their actual operating conditions. If you level either of them very carefully, you are all right.

MR. THORPE: I have three other questions here that I want to get through in the allotted time. The reason I am stressing them is because they too have come in in quite great volume.

"Five different surveying organizations have asked this question. All feel that three-screw leveling bases are faster and more trouble free than the regular four-screw base. Do manufacturers plan to equip transits and levels with three-screw bases?" I will ask that you keep your comments fairly short, because we have two or three more questions to cover.

MR. BEAN: I will begin by saying that all our 7- and 8-inch theodolites, as well as our precise levels, incorporate the three-screw base. We have tried to survey the market and determine whether a three-screw base would generally be acceptable, and frankly at this point we are in a quandary as to whether the average surveyor really wants the three-screw base, not for himself but for the men who are working for him, and are, through school primarily, accustomed to the four-screw base. We have no objection to going to the three-screw base if we can get some assurance it will be generally acceptable.

MR. WALDENBURG: I can only say that no manufacturer will adopt anything that he does not feel is going to be universally accepted.

MR. HARKNESS: I think all the manufacturers in past years, probably thirty years ago, had in their catalogs three-screw leveling bases, and they couldn't sell them. When you can't sell anything, why do you make it? Most of them took them out, and I know we did. I think some of the other manufacturers did. Again I agree that if there is a demand for them, we are going to make them. It is a matter of sales. We are in business just like you. If we can't sell something, what is the use of making it?

MR. BOLTER: The only comment I would

like to make is that I think you would have to look at that question objectively. Both the three-screw and four-screw leveling have their place. There are certain advantages. I will buy the three-screw leveling head for speed. I can set up an instrument in a fraction of the time with a three-screw leveling had than I can with a four-screw. On the other hand, if I want an instrument set up and I want to be sure that something hasn't changed, I will buy the four-screw leveling instrument. They both have their advantages and they are both designed for the particular job that they are going to do.

MR. THORPE: The next one is another important question: "Would it be possible for all manufacturers to standardize on the manufacture of points for plumb bobs, thus making them interchangeable." (Applause.) I know one gentleman in this audience to whom this is a dear subject. Take that microphone back there and give it to Mr. Greenwald again. He has been rabblerousing in California on that subject for a long time.

MR. GREENWALD: Thank you, Cliff. The subject of interchangeable plumb bob points is one we went into about fifteen years ago along with another manufacturer in California. We decided upon a good design. I brought it to Washington to the Bureau of Standards and they were willing to go along with the standard point design for thread size, diameter of the shank, the length of the point, the tapers, everything that you can think of about a plumb bob point.

To date some of the manufacturers throughout the country have gone along. Others have seen fit to stay with the same old plumb bob points that they have used for years, and years, and years. Each manufacturer that has not gone along seems to think that his plumb bob point is still the best.

We feel that to the best interests of all surveyors, cities, counties, and government agencies, all plumb bob points should be standard. With that in mind, we urge every manufacturer to adopt the so-called standard plumb bob point as it exists today.

MR. BOLTER: We threw in the sponge long ago. We adopted it. We adopted the American Standard Plumb Bob Point.

MR. THORPE: Mr. Waldenburg, you are another large manufacturer of them. In fact, I think you manufacture them for just about everybody on this panel up here. What are you going to do about it?

MR. WALDENBURG: I prefer to reserve all comment, thank you.

MR. THORPE: This question has been kicked around a little bit. I have to impose on Mr. Benjamin again:

"Would it be possible for tape manufacturers to use engineering block-style numbers on tapes to help eliminate errrors in misreading a 3 for an 8, etc."

MR. BENJAMIN: In our most recent tape we have given a great deal of study to the design of all figures. I heard something of this from our own booth. I compared some of our tapes. Obviously we can't afford to throw away old equipment, particularly on an article of rather a limited sale. The preparatory cost for new master equipment is terrifically expensive. You may find on some of our old tapes a peculiar little curlicue that I can see could easily be misread. For our most recent tapes, we have developed a square set of block figures that I believe are quite readable. We are giving this serious consideration and have been for some time.

MR. THORPE: "One of the greatest helps to the surveyor in the field would be the elimination of the awkward wooden transit case in favor of a metal case, such as those used with optical-reading theodolites."

MR. HARKNESS: The cost of changes in tooling to manufacture such a case would be enormous. When a manufacturer is tooled to do a certain job, he thinks twice before he spends perhaps $15,000 to just make a change. It costs money to change over to something of this type. Of course if, at the very beginning, we had started to make the other and somebody demanded wooden cases, it would cost us just as much to change over to the wooden cases. So, it is a question of economy of operation for us.

MR. BOLTER: Why make it out of metal instead of some one of the synthetic materials?

MR. THORPE: You have a good point there. I think the idea of the whole thing, as far as I am concerned, is that you can certainly beat yourself to death carrying those boxes.

Gentlemen, our time is exhausted. Thank your for your attention.

Record Center for IGY Data

The Coast and Geodetic Survey has opened in Washington, D. C., a record center for information being gathered in the western hemisphere during the International Geophysical Year about the earth's magnetism, earthquakes, and gravity. It is located in Temporary Building Y in northeast Washington.

Information will be exchanged with foreign centers in which corresponding data for the eastern hemisphere are concentrated. In time, the Coast and Geodetic Survey archives will have a complete set of data on geomagnetism, gravity, and seismology for the entire world.

The office is one of twelve set up in the United States and Alaska under direction of the United States I.G.Y. Committee. The other eleven are collecting data on other subjects. In the terminology used by the United States I.G.Y. Committee, the twelve constitute the "U.S. I.G.Y. World Data Center."

John W. Gettemy, an experienced geophysicist, will have charge of the Coast and Geodetic Survey's center. He and his dozen assistants will catalog and microfilm the mass of information that comes in from hundreds of sources, and will send prints to the foreign centers chiefly concerned.

Anyone may obtain copies of the data by paying for the microfilm. The charts and statistics will be of deep interest to scientists, and may also be quite useful to students.

The Survey will also maintain a "reduction center" in Temporary Y which will convert the data received from its own geomagnetic stations into a form usable by the world data center.

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Surveying and Other Problems Encountered in Offshore Well Locations

By G. W. HERZOG

SUPERVISOR, DRAFTING-SURVEYING DIVISION, SHELL OIL COMPANY

ON JUNE 23, 1947, the Supreme Court of the United States handed down a far-reaching decision involving rights in a three-mile marginal belt off the coast of California. In it the Court laid down the doctrine of Federal paramount rights, that is, that the Federal Government, rather than the State of California, has paramount rights in the submerged lands lying seaward of the low water mark for a distance of three miles. Prior to the *California* case, the Supreme Court had never passed directly on the issue of ownership of the submerged lands below the low water mark on the open coast. At the time of this decision, the State of California was granting oil leases in the three-mile belt giving the lessees authority to extract oil and other minerals therefrom.

The later cases of *United States* v. *Texas* and *United States* v. *Louisiana* are built upon the foundation of the *California* case. The *Louisiana* case presented substantially the same problems as the *California* case, but the *Texas* case presented a unique problem. This arose primarily from Texas' pre-admission status. In 1836, Texas revolted against Mexican rule, and on March 2, 1836, became an independent republic. The new nation succeeded to all the rights in the offshore submerged lands that were formerly held by Mexico. Immediately after Texas gained her freedom, the Congress of the Republic of Texas passed an act extending the civil and political jurisdiction of the nation to the territory "beginning at the mouth of the Sabine River, and running west along the Gulf of Mexico three leagues from land to the mouth of the Rio Grande." The question which the Court therefore had to specifically decide was to what extent Texas retained these rights when admitted to the Union in 1845. In upholding Federal paramount rights in the submerged lands off the coast of Texas, the Court said: "When Texas came into the Union, she ceased to be an independent nation. She then became a sister State on an 'equal footing' with all the other States. That act concededly entailed a relinquishment of some of her sovereignty . . . as an incident to the transfer of that sovereignty any claim that Texas may have had to the marginal sea was relinquished to the United States."

This was the status of things until May 22, 1953, when Public Law 31, the Submerged Lands Act, was passed by the 83rd Congress. Much has been written on this Act concerning the navigable water boundaries, coast lines, grantees, lessees, natural resources, and other items. The point of interest, especially to the State of Texas, is the provision in Section 4 of the Act which preserves the right of a State bordering the Gulf of Mexico to assert a claim to a "boundary beyond three geographical miles if it was so provided by its constitution or laws prior to or at the time such State became a member of the Union. . . ." Section 2(b) of the Act places a limit of three marine leagues (nine nautical miles) for States bordering the Gulf of Mexico. (This is equal to 10.3639 statute miles.)

EQUIPMENT USED IN OFFSHORE DRILLING

The principal purpose of this paper is to tell the story of some of the problems encountered in making offshore well locations.

The Shell Company used the Glasscock mobile drilling rig known throughout the oil industry as "Mr. Gus." "Mr. Gus" at one time or another held every drilling record for a mobile unit—for drilling in the deepest water (93 feet), for drilling farthest from land (65 miles), and for drilling the deepest well ever drilled by a mobile unit off the Coast of Texas (17,020 feet).

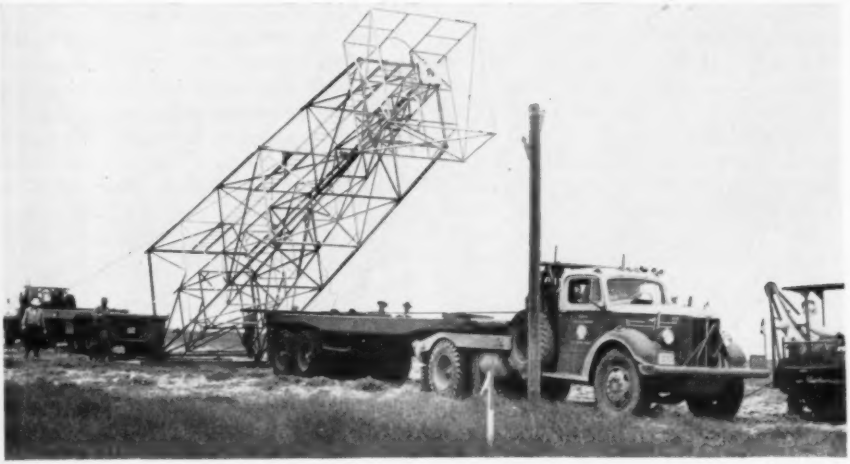
PORTION OF TEXAS COAST—REFLECTING STATE AND FEDERAL "GULF" SUBDIVISIONS

In October 1954, work was started on our first well location to be made offshore in the Gulf of Mexico. We had gained some experience in shallow water bay locations, but to be confronted with spotting a location from 5 to 20 miles out in the Gulf on the high seas, where the water was from 30 to 50 feet deep, presented new problems. In solving these problems, some of the tools and techniques of long-range land surveying were utilized, and added to this were several newly designed pieces of equipment. Thus, through a new application of instruments and a new design and use of materials, it is felt that we have pioneered in this work, at least to the extent that it differs from what has gone before.

By the middle of 1955, we had successfully completed two offshore locations from 5 to 10 miles seaward, and, needless to say, had gone through a certain amount of trial and error in methods, design, and choice of equipment. Before the end of 1956, we had penetrated into the Gulf a distance of approximately 65 miles. Two separate locations were made in a block of some 100,000 acres, averaging 63 miles offshore southeast of Galveston.

OFFSHORE DRILLING BLOCKS

All offshore drilling blocks are owned either by the various States or the Federal Government. A very accurately plotted map reflects the offshore subdivisions as they will exist from now on. All Federal blocks are based on the Texas (Lambert) Plane Coordinate System and the grid azimuths and coordinates of triangulation stations are as developed by the United States Coast and Geodetic Survey. The Gulf subdivisions fall within two of the five Lambert zones into which the State of Texas has been divided. All Federal sections off the Texas coast are three statute



SURVEY TOWER—METHOD OF TRANSPORTATION AND ERECTION

miles square and contain 5,760 acres. The regular State and Gulf Subdivisions, that is, those falling within the three-league boundary are also three miles square. Where the subdivisions are adjacent to the coastline and are irregular in shape, the acreage figure will vary, and, for purposes of leasing, the State has estimated the individual block acreage. To coincide with the three-mile section, subdivisions contiguous to the irregular sections, the blocks were laid out in one-mile squares containing 640 acres.

In Louisiana, the Federal Government also followed the State (Lambert) subdivision system. As the State of Louisiana had originally subdivided its offshore area into 5,000-acre blocks, the entire Louisiana offshore Federal and State subdivision network is so divided. Thus, between the Texas and Louisiana offshore sections there is a difference of 760 acres in the large subdivisions.

The method of selling these submerged lands is simple. Anyone interested in a particular block asks either the State or Federal Government to put that particular block up for auction. All concerned are notified and then "the bravest pay the most." One particular spread of acreage consisting of a number of Federal blocks was leased for slightly over $5,000,000. With the blocks being sold at premium prices, it naturally follows that any location made offshore must be precisely controlled. We, of course, as do all other oil companies, tie all offshore location work to the inland Coast and Geodetic Survey network.

SURVEYING TECHNIQUES

To augment our line of sight we designed and supervised the construction of our own transit towers which consist of double towers. The inside tower for the instrument is completely separate and apart from the outside or "personnel" tower. These towers are about 45 feet tall, constructed of two-inch pipe and well braced, with all joints fully welded to give complete rigidity.

Radio Phone Communication.—Concerning the problem of communications, we first experimented with the handie-talkie radio sets but soon found that a more powerful set was desirable. We used the Motorola Model D-41G with TA 111-S receiver (48.70 meg.) mounted in wooden boxes for protection in handling. With four sets of this type, our chief surveyor, who may be some 20 miles offshore, with his assistants, is able to give directions to and at the same time discuss immediate problems with the instrumentmen on the three towers. At

the same time that he is talking to our field personnel, a radio technician is directing the conversation by transmitting the messages through an amplifier which enables the Houston office to talk directly with the chief surveyor aboard his boat or to the tower men themselves. In this manner many unexpected problems can be pretty well thrashed out as they arise, because all interested are listening in as the chief surveyor describes the problem and issues new directions to all concerned.

Buoys.—A new problem to us was that of marking positions in the Gulf, such as semipermanent reference markers, barge-position markers, direction lines, etc. For this purpose, several types of buoys are employed. Here again it may be interesting to point out that for our purpose and requirements we found no commercial buoys available. We, therefore, called in a firm whose sole business is that of constructing and installing buoys. At the conclusion of several conferences concerning types of buoys needed by us we began construction of several types. The large reference buoy gave us some concern at first. For this principal buoy design, we agreed on a lighted buoy consisting of a counterweighted body of salt resistant aluminum with a cylinder of the same material supporting a 6.2-volt lantern six feet above the water line. The supporting cylinder contains dry-type air depolarized batteries, said to be capable of operating the light and flashing mechanism for 200 days. Buoyant material is expanded synthetic rubber. The buoy weighs 575 pounds and is anchored to a 2,000-pound block of cast concrete with ½-inch chain. This large reference buoy is never placed exactly on location, but rather 1,000 to 2,000 feet from our desired location.

The problem involved in a buoy of this type was the requirements which we were forced to meet; namely, the buoy had to be lighted in order to present an aid rather than an obstruction to navigation; it had to house lights, batteries, and had to be of such weight that it could be both transported and handled by a normal boat crew. Yet it had to be constructed so that it would ride out the unusual high seas prevalent in the Gulf during the winter months. Further, this buoy had to house dry batteries as well as the delicate mechanism which automatically replaced burned out globes. Last, but not least, the lenses had to conform to certain marine requirements. Not knowing exactly when the portable drilling barge would be

LIGHTED LOCATION BUOY

able to get out on location we felt that our lighted reference buoy might have to stay in the water from 90 to 200 days. In the final analysis, this particular buoy was in the water some 7 months before we used it. We periodically checked its position during this period.

Another type of buoy used was the simple styrofoam marker, or flag buoy, with ample anchor. While this buoy weighed a couple of pounds, we quickly found out an 8- or 10-pound window sash weight was entirely too light to hold this buoy and we ended up with an 85-pound drill-pipe coupling as an anchor.

A conventional type buoy for locating direction markers and position markers for the drilling barge was also designed and constructed by our engineers. This general

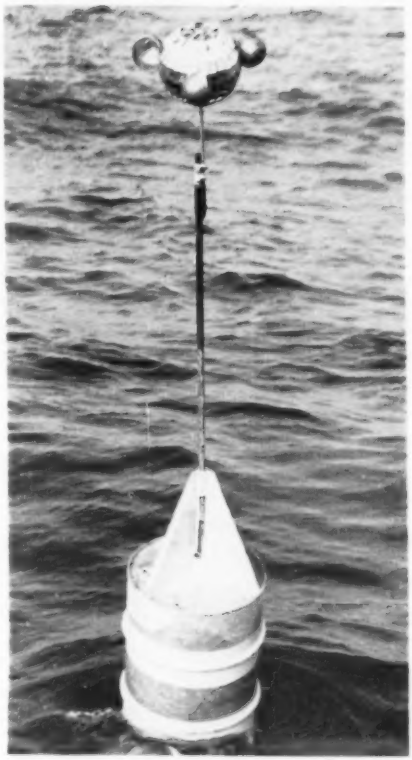
purpose buoy consisted of two 30-gallon oil drums welded together and weighted with 135 pounds of concrete set in the bottom to help stabilize it in rough water.

All buoys presented anchoring problems. We finally settled on rectangular concrete blocks weighing up to 2,000 pounds for the very large buoys, or circular concrete blocks from 4 to 6 inches in thickness and about 20 to 24 inches in diameter for the smaller type drum buoys. The reasons we adopted the concrete anchor block were: (1) it is economical; (2) it discouraged theft of a $25.00–$100.00 anchor; and (3), after many experiments, we found these blocks to be quite efficient as anchors.

To further assist in making long shots, our engineers conceived the idea of a revolving mirror target to be attached to the drum buoys for day work and a revolving light for night work.

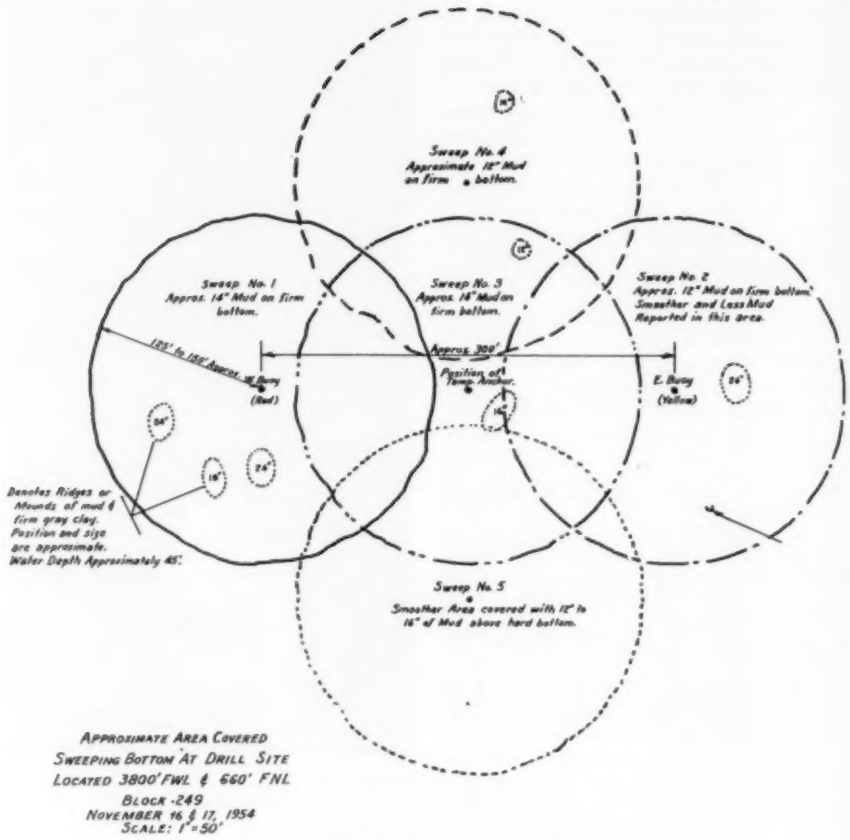
Another type of buoy to meet the need for one high enough above the water to be easily seen and still be light enough to handle manually was designed by one of our engineers and built by our offshore group.

Divers.—Once the location for a well to be drilled with a mobile drilling barge has been established, it is necessary to determine the contour of the Gulf bottom and whether the area is free of obstruction. To date, the most satisfactory method is to employ divers to sweep the bottom. This is done by laying out a buoy pattern arranged to cover the area where the barge is likely to rest. The boat is securely anchored over the spots thus marked, in systematic order, and a heavy weight lowered over the side for the diver to circle around at each. The sweep is made by the diver circling the weight at the end of a 150-foot line, while in communication with the boat. It is thus possible to plot irregularities in the Gulf floor and changes in the type of bottom by talking with the diver, as his position is calculated from air bubbles at the surface. Another method of checking for obstructions on the bottom is to use a shrimp boat and drag the area in question either with an old shrimp net or a length of chain. However, this does not give an accurate indication of bottom contour or soil type.



LOCATION BUOY—WITH MIRROR TARGET ATTACHMENT

Diagram for Approach of Drilling Barge.—Once the path for the approach of the drilling barge has been marked, after having given due consideration to the tide or current, and especially wind, it falls to the chief surveyor and his assistants to suggest to the tug captain the general direction of approach for the drilling barge. Once having entered the pattern marked by us with buoys, the drilling barge was more or less on its own, because having reached the immediate area in which they were to conduct their drilling it must necessarily be the responsibility of the personnel on board the drilling barge to spot the barge.

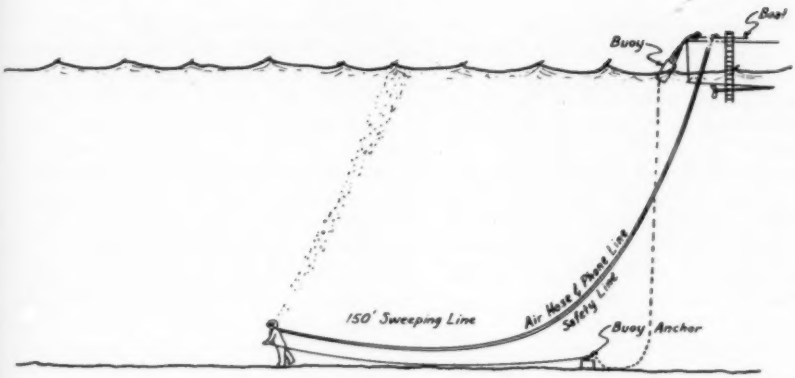

Sweep No. 4
Approximate 12" Mud on firm bottom.
Sweep No. 1
Approx. 14" Mud on firm bottom.
Sweep No. 3
Approx. 14" Mud on firm bottom.
Sweep No. 2
Approx. 12" Mud on firm bottom. Smoother and Less Mud Reported in this area.
Approx. 300'
Position of Temp. Anchor
E. Buoy (Yellow)
Douglas Ridges or Mounds of mud & firm gray clay. Position and size are approximate. Water Depth Approximately 45'.
Sweep No. 5
Smoother Area covered with 12" to 16" of Mud above hard bottom.
Approximate Area Covered Sweeping Bottom At Drill Site Located 3800' FWL & 660' FNL Block -249 November 16 & 17, 1954 Scale: 1"=50'

TYPICAL SWEEPING PATTERN

ELECTRONIC SURVEY

In a few instances where our drilling operations carried us beyond line-of-sight distances, we were forced to rely on electronic methods for making our locations. In our work we used a phase-comparison system. The principle is that of measuring phase difference of the radio waves received from two continuous-wave transmitters. Points of equal phase, form lines which are hyperbolas, and a family of hyperbolas is developed over the earth's surface with the two transmitter antennas at the foci. A phasemeter on a mobile receiver indicates the position of the receiver as being along one specific hyperbola.

To obtain a position fix, a second family of hyperbolas intersecting the first is established by two more transmitters, and a second phasemeter on the mobile receiver indicates position as being along a specific hyperbola of the second family. The position occupied by the mobile receiver is at the intersection of the two hyperbolas indicated by the two phasemeters. Geographic position can be determined on a map on which the hyperbolic grid has been plotted, or position may be determined by direct computation.

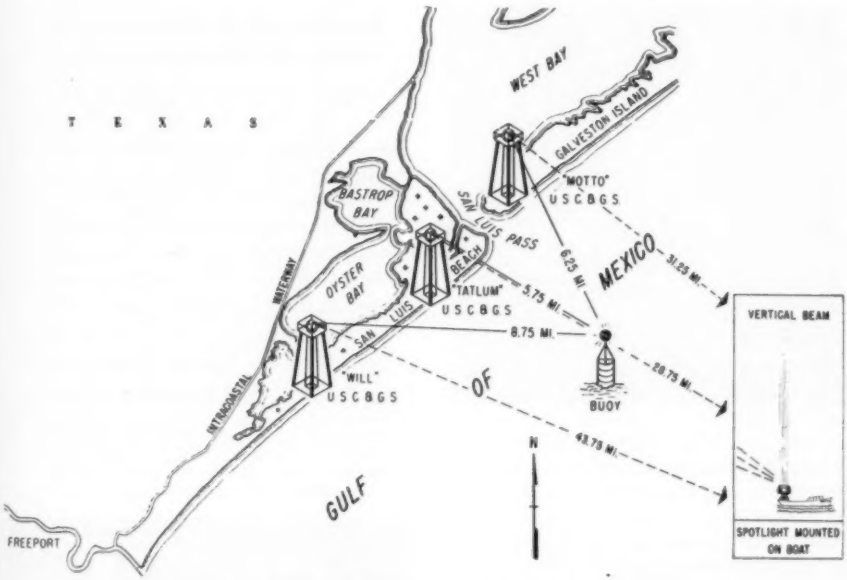


METHOD USED TO DETERMINE CONDITION OF GULF FLOOR

DIVER SWEEPING IN ACCORDANCE WITH PREPARED SWEEPING PATTERN

In practice, only three transmitters are required to generate the two intersecting hyperbolic families, the center transmitting antenna being a focus common to each family.

The switch from conventional triangulation work to an electronic system retains much of the basic concept that has always been evident in our survey operations. The electronic survey is tied to the Coast and



UTILIZATION OF SURVEY TOWERS

Geodetic Survey first-order horizontal control net, mapping is done on the Lambert conformal projection, closed traverses are run, and the proposed well locations are first determined in terms of Lambert coordinates. The Lambert coordinates are computed in our survey section. These coordinates are furnished the contracting electronic company, who, in turn, convert by calculations the Lambert coordinates to hyperbolic lane readings in advance of the beginning of field operations.

The electronic operation using the predetermined hyperbolic readings of the well location site and a Lambert grid map with the hyperbolic lines or "lanes" superimposed thereon directs the boat to the well location. When the boat passes the desired location a small styrofoam buoy is thrown overboard. Readings are taken on the four cardinal sides of the styrofoam buoy. These data are radioed to a supervising computer at the base headquarters. When headquarters are satisfied with the position, they advise that the large permanent buoy may be set. Readings are then made on the four cardinal sides of the permanent buoy. The boat then returns to the initial calibration station to close the traverse. If everything is in order, the readings taken on the permanent buoy are accepted as final.

San Francisco Bay Area Science and Industry Tour

The International Science Foundation, California Academy of Sciences, has established an aerial science and industry tour to accommodate the visiting engineers and scientists making use of its facilities in the Golden Gate Park. In addition to serving visitors to the Foundation's center, the tour will be available to the public as a regular Gray Line sightseeing tour.

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Nova Scotia Land Survey School

(History and Future Development)

By J. A. H. CHURCH

P.L.S., NOVA SCOTIA, CHIEF INSTRUCTOR

This article is reprinted, with permission, from the *Nova Scotian Surveyor*, Vol. 5, No. 11, May 1957. It shows the efforts being made by one Canadian Province to develop Provincial land surveyors well grounded in the basic requirements of their profession. These efforts present an interesting contrast to the apprenticeship program recently initiated in Wisconsin and aimed at accomplishing essentially the same result. The Wisconsin apprentice program is described elsewhere in this issue. —EDITOR

THIS SCHOOL, the only one of its kind in Canada, was opened in No. 6 (Army) Vocational Training School on the grounds of the Nova Scotia Technical College, Halifax, in November 1945. The purpose was to train veterans of the Second War to become qualified Provincial land surveyors in any of the three Maritime Provinces under the auspices of the Department of Veterans Affairs. A syllabus of training was submitted for approval to Dr. F. H. Sexton, Director of Technical Training, and subsequently to each of the three Maritime Provincial Governments, and to the Department of Veterans Affairs. The course was designed for twelve months duration under a certificated Provincial land surveyor, the basis being 50 per cent of that period to be allotted to theory, and 50 per cent to actual field work, the passing out test being the statutory examination of any of the Provinces concerned. All Maritime Provinces and the D.V.A. agreed to the scheme, which was put into operation.

AIMS OF TRAINING

Requirements of the syllabus:

1. The development of surveyors well grounded in the basic requirements of their profession so that in the course of time they might develop that faculty for critical analysis so essential to sound practice in their profession, and which is based upon a knowledge of fundamentals.

2. There was no expectation that graduates would be expert surveyors after twelve months training, but it was hoped that, with the theoretical and field training given, the more alert would learn, from their individual experience, the limits of accuracy possible with the instruments furnished by the school, and also the standards of accuracy requisite on any particular type of work.

3. It was expected that the more alert graduates so grounded would improve their technique, judgment, and dependability proportionately to the class of company in which fortune might place them. After twelve years of experience it has been gratifying to see how high a percentage of graduates has done just that.

SCOPE AND METHOD OF TRAINING

In Nova Scotia there exists no general framework of survey, so it may be classified as unsurveyed territory in which the Geodetic Survey has established survey monuments of a very high order, and the Topographic Survey has established permanent marks by traverse from the Geodetic Survey monuments. Full particulars of these permanent marks and geodetic triangulation stations are now obtainable from the Department of Mines, Halifax.

Such being the case any surveyor should be capable of picking up a monument and transforming the listed coordinates, whether geographical or rectangular. A study of the Mines Act, Nova Scotia, will show what is entailed in respect to modern systems for staking and recording mining claims, both in theoretical and practical survey methods, and that in certain circumstances the astronomic azimuth must be obtained by observation.

Recognition was given to these considerations at the inception of the school. The Mines Act of Nova Scotia has confirmed our recognition of the prime necessity for instruction in all topographical methods of survey on the elementary level such as can be attained with the engineers transit reading to one minute, and that in a twelve months course.

Particular emphasis has been laid on solar and stellar observations for azimuth and time; determination of latitude seems to be somewhat doubtful using the engineers transit—anyway we do not have much success with it. Star identification is taught by the monthly issue of a star chart showing those listed in the American Nautical Almanac on a grid indicating the lines of azimuth and altitude at 21 hours A.S.T., on 15th of each month and for the latitude and longitude of the school. Three azimuth determination stations have been set up close to the school, the direction of the R.O. being determined by the mean, about 1000 observations, to a toleration of plus or minus 30″ in azimuth and 5 seconds of time.

TRAINING IN PROFESSIONAL PRACTICE

This phase of the training aims at realism and is based, in order of importance, on the general considerations:

1. Ethics. Development of professional consciousness, the sole source of professional status, and the only method whereby the surveying profession can be of service to the general public, the association of Provincial Land Surveyors of their Province, and ultimately to themselves. If any surveyor imagines he can ignore ethical considerations in favour of his immediate financial gain, he is surely "barking up the wrong tree;" such a one will never advance beyond the technician status—his epitaph might well be that in the "Ode to a Suicide" by Robert Burns.

2. The function of a surveyor is not a judicial one, but merely that of a collector and compiler of evidence found in the field.

FIELD WORK

Field work may be considered under two main categories:

1. Retracing the boundaries, run originally by magnetic compass. Under this heading it is a pleasure to give recognition to the invaluable aid given the school by the excellent training in forestry which graduates of the Maritime Forest Rangers School of Moncton, N. B., have made available while attending this school, to J. E. R. March of the Department of Lands and Forests, and to R. E. Dickie of the Mersey Paper Company, both of whom train students in forest survey every year.

2. General P.L.S. practice. The only avenue by which a student may acquire experience is that of a member of the survey party working with, or under the personal supervision of, the Chief Instructor, who holds a certificate. The procedure followed is:

(*a*) Thorough briefing of the party.

(*b*) Search of title at the Registry of Deeds Office.

(*c*) Field work, including tie in to some adjacent topographical feature, referencing of all boundary posts, closed traverse being obligatory, and an astronomic observation, if possible.

(*d*) Office work, computation, balance of the traverse lines, and where necessary of boundaries, closure required better than 1 in 3,000 and one minute times square root of number of set ups of the instrument, plotting by coordinates, computation of area with planimeter check.

(*e*) Preparation of plan in accordance with the rules of the Registrar of Deeds.

(*f*) Preparation of legal descriptions by metes and bounds.

Any deficiency at any stage entails that the originator of the blunder go out to rectify same. Our motto is: "That is your very own mess, go out and clean it up."

The procedure is somewhat time consuming, but it does tend towards improvement in technique. On a survey the students are slow, exceedingly slow but, we like to think, thorough.

CHANGE IN MANAGEMENT

The school was started under the scheme for Rehabilitation Training for Veterans sponsored by the Department of Veterans Affairs, which started in November 1945 and terminated in December 1948. Con-

ditions were not conducive to training students in land survey [in Halifax], and with the consent of Dr. F. H. Sexton and the D.V.A. the locale was changed to Lawrencetown, and later to Middleton in the Annapolis Valley. This phase came to an end in December 1948.

On the advice of Dr. Sexton, the Vocation Education Division of the Department of Education was consulted and on September 1st, 1949, the school opened under the direction of E. K. Ford, of Lawrencetown, Annapolis County, in the class room specially prepared for the purpose by the Lawrencetown Branch No. 112, Canadian Legion, B.E.S.L. The class room has accommodation for 15 students.

Breakdown of 10 Years Operation

Completed Course	115	
Sat Examination	115	100%
Certificates Obtained	112	97%
Failed	3	3%

Six students have been required to sit supplementaries, varying from 2 papers to the entire examination—all were successful.

Employment of Graduates

The following is somewhat conjectural, being to some extent hearsay.

Federal Government	33%	In Canada
Provincial Government	20%	
Other Survey	43%	
Caribbean Surveys	4%	
	100%	

Student Origin

Nova Scotia	87	76%
New Brunswick	15	13%
Newfoundland	1	
Ontario	3	
Saskatchewan	1	
Alberta	1	
B.W.I.	6	
U.K.	1	
TOTAL	115	

FUTURE DEVELOPMENT

The keynote to this aspect is, without any doubt, to be found on page 137 of the July 1956 issue of *The Canadian Surveyor,* part of the "Brief to be presented to the New Brunswick Development Commission" by the Association of New Brunswick Land Surveyors, and I quote "We strongly recommend that the two Provinces (New Brunswick and Nova Scotia), on a departmental, Provincial Land Surveyor's Association, or higher level, meet together with the object of having one land surveying school for both Provinces; the objective of this school being to (1) train Provincial land surveyors, (2) train cartographers, (3) build up a surveyors hand book, (4) disseminate technical advances."

In the summary of recommendations on page 136 of the same publication will be found, and I quote "We recommend the participation of New Brunswick in the operation of the Nova Scotia Land Surveyors School as presently operated by the Province of Nova Scotia. This recommendation is made in the hope that land surveyors might procure adequate basic training, and the standards of land surveying might be improved."

Members are aware that our Association hopes to present, and have approved, a bill of incorporation of the Association of Nova Scotia Land Surveyors at the forthcoming session of the Provincial House of Assembly. In that bill is incorporated the syllabus of training and examination so ably drawn up by J. H. Holloway, D.L.S., A.L.S., of Edmonton, Alberta, for the Committee of Survey Officers under the chairmanship of R. Thistlethwaite, Surveyor General of Canada. The most important clauses therein are (1) a three-year apprenticeship, and (2) an intermediate examination in theory on the standard of first year university in mathematics, physics, and the English language.

Probably most of us will agree that the young aspirant surveyor of the Maritimes would have a tough assignment under the new setup of the intermediate examination, to say nothing of a "souped up" final which will be required to bring Nova Scotia into line with Canadian practice. Our Province has recognized the necessity of a school under presently existing conditions—one may claim that the School, as it is today, has been adequate, but, most emphatically, it will not do in the future.

After discussion with many interested members, some of them graduates of the School working in Nova Scotia and elsewhere in Canada, it would appear that a solution should be sought along the lines:

1. The entrance requirements for acceptance at the School to be completion of one year apprenticeship under a Nova Scotia or New Brunswick land surveyor.

2. For students from outside the Maritimes, one year experience (6 months in the field) or apprenticeship under a Provincial land surveyor, subject to an entrance examination envisaged in the Act of Incorporation at the discretion of the Association.

3. Duration of the course: two years, during which time students should, with the cooperation of the Departments of Provincial Governments and Forestry Companies, have practical experience in the field for at least three months continuously each year. It is submitted that no school can give such practical experience over such a period.

4. Purpose of the course: preparation for (1) Intermediate Examination, 1st. Year, and (2) Final Examination, 2nd. Year.

5. Paragraph 4 entails (1) drafting, (2) photogrammetry, (3) English, i.e., preparations of reports, etc., (4) elements of geology, botany, etc., (5) mathematics, and (6) physics.

ORGANIZATION

At present our accommodation is limited by floor space to 15 students. This year we have had to turn away 10 qualified for entrance. The staff consists of a Chief Instructor, the holder of a Nova Scotia Certificate, and one Aide selected from among the students each year. It will be evident that either a vast change will be necessary, or the school will fade out of the picture.

In addition to the School of Land Surveying, and indeed complementary thereto, a School of Cartography is a crying need. Such School would be open to students of both sexes, and would give instruction in (1) English language, (2) mathematics, (3) physics, (4) drafting-cartography standards, (5) map projections etc., (6) photogrammetry, (7) map production from the earliest stage to the final printed sheet. The graduate of such a school would find ready employment at a respectable remuneration. It may be claimed that the setup outlined would constitute a balanced program in the survey field the like of which does not exist yet anywhere in Canada.

FEASIBILITY

The Lawrencetown Branch No. 112, Canadian Legion, has, by unanimous resolution, offered to the Department of Education, as a gift free of encumbrance, the plot of land where the school is now located in exchange for their use of an assembly room to accommodate some 25 Legionaires for so long as that Branch operates under a Charter from the Dominion Command of the Canadian Legion. Short of a 3rd World War such period cannot be of any lengthy duration. The plot of land fronts on Provincial Highway No. 1, and comprises one acre of land suitable for building, located 200 yards from the Post Office; the southern boundary is the right bank of the Anpapolis River.

For the past three years we have been investigating the possibility of obtaining a sum of money, amounting in all to about $100,000, in bequests from the late Dr. Hall and his widow for the building, equipment, and maintenance of a Vocational School in the County of Annapolis. It is understood that the various Provincial Government Departments concerned in such a project have come to general agreement with the Trust Company administering the estate. It would ill become the writer to predict the outcome of the negotiations now in progress, as the settlement is solely in competence of the Government. While the sum involved is not sufficient for the whole scheme envisaged, it is quite a start.

CONCLUSION

This plea for an enlarged school adequate to meet the requirements necessitated by recent technicological advances, chiefly in

flying and aerial photography, is not in any way influenced by a desire to enhance the size and importance of the school and/or the staff. It is simply recognition of the fact that all institutions are faced with the alternative of either growing with the needs of the social environment, or stagnating.

The Associations of Lands Surveyors in the Maritimes have shown their desire for growth to the standards of their sister organization in Canada; their goal being standardization of training and examination throughout the country. The "crux" of the situation is whether or not we implement our wishes by adequate training. It is not claimed that the School is anywhere near the ideal; it is only too evident that there is room for improvement. But we do claim to have turned out a number of useful men alert enough to make use of the grounding in basic principles received in school. Our graduates may be found practising as certificated land surveyors in every Province of Canada, except Quebec and Newfoundland.

A letter dated November 1st, has been received from W. F. Roberts, of the Department of Lands and Mines, New Brunswick, stating that the Minister of that Department has given his approval to a scheme for sending two apprentice surveyors to this school each year. While attending the School each apprentice will receive 75 per cent of his pay. Mr. Roberts asks that two vacancies be kept each year for two New Brunswickers. This action is proof that our sister province approves of our efforts, and is willing to cooperate in the setting up of a Maritime School.

Maps and Plats of the Bureau of Land Management

While the Bureau of Land Management, Department of the Interior, is not considered a mapmaking agency, it does have map records which are of much interest and extreme value to the engineering profession and the public in the area of the public domain.

The official wall map of the United States has been published by this Bureau and its predecessor, the General Land Office, since the turn of the century. This map, approximately 5 by 7 feet, is in two sheets and printed in nine colors. It shows the historical development of the territory of the United States by cession from the Thirteen Original States and by foreign nations, by purchase and annexation. The major Federal use of the lands, such as National Forests, Indian Reservations, National Parks and Monuments, etc., are shown by appropriate colors.

Great interest has been shown in this map and there has been an extremely wide distribution. Copies may be procured from the Superintendent of Documents, Government Printing Office, Washington 25, D. C.

This Bureau has custody of the records of the public-land surveys which cover the area north and west of the Ohio and Mississippi Rivers (except Texas), and Alabama, Mississippi, and Florida. These survey records consist of the official plat of each township and the written field notes which are descriptive of the lines run and corners established. The plats represent the directions and lengths of the township boundaries and sections and the official areas of those subdivisions.

These public-land surveys were initiated as one of the first acts of the new Republic; the first act of Congress directing these surveys was passed in 1785. The surveys have been carried on since that time and are still in progress. These records are extremely valuable within the area of the public domain for the reason that they are the *basic* records of the boundaries of parcels of land throughout the vast area of the public domain. It may be truly said that the title to approximately 75 percent of the land in the United States is based on these records.

Photostat copies of the plats and field notes may be obtained, at cost of production, from the Bureau of Land Management, Washington 25, D. C. Copies relating to the surveys in the particular States also may be obtained from the State Supervisors of the Bureau of Land Management in Phoenix, Ariz.; Sacramento, Calif.; Denver, Colo.; Boise, Idaho; Billings, Mont.; Reno, Nev.; Sante Fe, N. Mex.; Portland, Oreg.; Salt Lake City, Utah; Spokane, Wash.; and Cheyenne, Wyo.

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Wisconsin Land Surveyor Apprentice Program

The following information on the new Wisconsin land surveyor apprentice program was abstracted from Circular Letter No. 20, April 1, 1957, issued by the Apprenticeship Division, Industrial Commission of Wisconsin, and an attachment thereto designated as Exhibit "A," Land Surveyor. All persons who are concerned with the constantly growing scarcity of really competent land surveyors will be interested in this approach to the problem. Others will be interested from the standpoint of securing similar programs in their own States or from the standpoint of the protection of the land surveying profession afforded by registration laws.—EDITOR.

The land surveyor registration law of the State of Wisconsin, passed in 1955, specifies that after January 31, 1956, no person can practice land surveying in that State unless he has been issued a certificate of registration by the Wisconsin Registration Board of Architects and Professional Engineers. One method outlined in the law to qualify for such certificate is that the applicant satisfactorily complete an apprenticeship training course prescribed by the Industrial Commission and satisfactorily pass an oral and written examination as prescribed by the Board.

Indenturing of apprentices in this type of occupation is something new in Wisconsin. Normally, a trade is considered apprenticeable only if it involves the development of manipulative as well as technical skills. Nevertheless, in compliance with the law, it has been necessary to develop a schedule of apprenticeship training in land surveying. The schedule given below was developed by the Apprenticeship Division of the Industrial Commission with the assistance of the civil engineering departments of the University of Wisconsin and the University Extension Division.

Although only a few applications for approval of indentures are expected in the land surveying field, the program should be a valuable tool in developing well qualified land surveyors.

The term of training is six years of no fewer than 39 weeks a year. If the applicant has had prior experience or pertinent schooling, he may be granted time credit on the six-year term as evaluated by his employer and the Industrial Commission. The apprenticeship law requires that, if the term of training exceeds two years, a minimum total of 400 hours of school attendance must be completed by the apprentice. The law also requires that the employer pay for these school hours at the same rate as for services. Courses are available through the University Extension Service, as well as local vocational schools. If the applicant desires, his curriculum can be arranged so that he is working toward an engineering degree at the same time he is employed on his indenture.

Minimum compensation to be paid to apprentices under this program is specified by law as set forth below:

Year	*Percentage of registered land surveyors rate*
1	45
2	50
3	60
4	70
5	80
6	95

On completion of the indenture, the apprentice will be eligible for examination by the Wisconsin Registration Board of Architects and Engineers to determine whether he is qualified for registration as a land surveyor.

The table below outlines the processes in which apprentices will be given an opportunity to acquire knowledge and experience. The percentages shown indicate the proportions of the total time which will be devoted to each process.

SCHEDULE OF PROCESSES

1. *Use and Care of Tape, and Linear Measurement* (9%)

Field procedures of making linear measurements of varying degrees of accuracy. Taping procedures holding the tape horizontal. Taping procedures measuring on the slope, and computations involved to convert to horizontal. Temperature and pull corrections. Measurement of angles with a tape. Laying out right angles with a tape. Calibration of a tape.

2. *Leveling* (5%)

Care of the level. Setting up the level. Reading rod direct and with target. Field procedures and notes for establishing bench marks. Practice in running levels to 0.001 foot with balanced backsight and foresight distances. Adjustment of the dumpy and wye levels. Field procedures and practice in running double-rodded level lines. Reciprocal leveling. Adjustment of elevations in closed level nets. Determination of sensitiveness of the bubble tube. Listing optical properties of the telescope. Use of the hand level.

3. *Basic Transit Work* (10%)

Care of the transit. Setting up and operation of the transit. Measurement of horizontal angles and running of horizontal angle traverse. Azimuth traverse. Deflection angle traverse. Measurement of angles by repetition, direct and reverse readings. Laying off angles by repetition. Measurement of vertical angles and determination and correction for index error. Extending a straight line by double centering. Establishing intersection of lines. Prolonging a line past obstacles; methods of offsetting. Measurement of angles when transit cannot be set at vertex of angle. Adjustment of the transit. Adjustment of angles in closed traverse.

4. *Compass* (2%)

Care and use of compass. Compass traverse and adjustment of angles to include effects of local attraction. Use of the compass on the transit to provide checks on transit traverse. Setting declination on the compass.

5. *Profile Leveling; Cross Sections; Grades; Earthwork* (4%)

Field experience in running profile levels, taking cross sections and setting slope stakes. Field note forms. Plotting of profiles and cross sections. Computing earthwork volumes.

6. *Transit Traverse* (9%)

Running of transit traverse to establish control for surveys. Office experience in computing traverse, including computation of latitudes, departures, and distribution of errors of closure. Methods of checking traverse by both office and field procedures.

7. *Determination of Land Areas* (6%)

Field surveys and computations involved in determining land areas. Computations should include various methods of computing area, such as double meridian distances, coordinates, irregular areas by offsets, triangles, and planimeter.

8. *Stadia Surveys* (3%)

Field procedures of transit-stadia surveys. Keeping of notes. Reduction of stadia notes. Determination of stadia constant.

9. *Construction Surveys* (2%)

Staking of line and grade. Staking out buildings. Setting batter boards.

10. *Astronomy* (3%)

Field observations and computations necessary to: (a) determine lattitude by observation on the Sun and Polaris, (b) determine true azimuth by observation on the Sun, (c) determine azimuth by observation on Polaris at any hour angle, and (d) determine azimuth by observation on Polaris at elongation.

11. *Horizontal and Vertical Curves* (10%)

Computation of simple horizontal curves by deflection angle, chord offset, and tangent offset methods. Field procedures of staking horizontal curves by each of the above methods. Computation and staking of horizontal curves when field conditions restrict position of the curve and procedures for staking the curves. Field procedures and office computations necessary to fit curves to fixed existing conditions. Compound and reverse curves. Computing and setting grade for parabolic vertical curves. Computation of areas involving curved boundaries.

12. *Precise Transverse* (2%)

Field methods and computation of precise traverse to produce precision of 1/10,000 or better.

13. *Triangulation* (4%)

Field procedure of base line measurement and measurement of angles for at least third-order

triangulation. Computation involved in solution of a quadrilateral.

14. *Boundary Location and Relocation* (20%)

Resurveys involving the public land system. Reestablishing obliterated corners. Reestablishing lost corners to include single and double proportionate measurement. Resurveys of metes and bounds descriptions. Resurveys of platted lands to include proportioning of excesses and deficiencies. Land surveys for purposes of obtaining information for metes and bounds descriptions. Writing of descriptions, including metes and bounds descriptions. Field procedures of platting in accordance with Chapter 236 of the statutes of the State of Wisconsin. Subdivision of U. S. public land survey sections.

15. *Topographic Surveys* (10%)

Field methods of obtaining the necessary data for preparation of large scale topographic maps to include transit-stadia method, grid methods, and cross-profile or cross section methods. Preparation and drafting of topographic maps to include the various methods of plotting control, plotting of detail, and drawing of contours by various methods of interpolating.

16. *Use of Aerial Photographs in Land Surveying* (1%)

Interpretation of photographs as needed for land surveys. Scale determination of aerial photographs and accuracy. Applications in job studies and planning. Use of aerial photographs for checking field surveys.

Spanish Journal Features Colorado School of Mines

A recent issue of *Mineria y Metalurgia*, Spain's outstanding mineral-industries journal, was dedicated to the Colorado School of Mines. The magazine devoted most of the entire issue to articles and photographs of the school. It included sections dealing with each of the six degree-granting options offered by the school, along with a photo story on each.

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Forthcoming Report on Scribing in the United States

By KENNETH R. DEARDORF*

AS THE WORK of the Inter-Agency Committee on Negative Scribing enters upon its final stages, it seems proper to review the objectives and accomplishments of this cooperative group, and to discuss the fruits of its labors, which it is hopeful will soon appear in printed form. Chapter I, the first of three in a report covering the whole field of negative engraving on coated plastics in the Federal mapping and charting agencies of the United States, has been completed and is in the process of being printed. The other two are due to follow soon after. Chapter II will be a collection of special reports, individually prepared by each of the contributing agencies, describing the development of negative engraving on coated plastics and its applications as utilized by each. Chapter III will be principally made up of a glossary of scribing terms.

Scribing in the United States may be likened to a number of roads, all going in the same direction, but over differing kinds of terrain. The major Federal mapping and charting agencies adopted scribing unanimously and wholeheartedly only a few years ago. The same principles have been basic to all. Yet the differing objectives of each agency, and the necessity of adapting the technique to these varied objectives, produced a variety of approaches which, to an outsider, might even have had the look of mild chaos. The prestige attachable to him who becomes "firstest with the bestest" fostered an element of competition in the development of better instruments, materials and techniques.

The competition has undoubtedly been healthy. The variations in application, far from being chaotic, have been the adjustments of an only recently infant art to its various homes of adoption. The Committee's report may well be expected to relieve the appearance of confusion, as well as supply a central fountainhead of scribing wisdom from which all users, both in being and potential, may sip as suits their thirst.

The Bureau of the Budget, sensitive to efficiency and economy, viewed the field of negative scribing and saw a need for correlation of the several directions in which development was taking place. Particularly, two major trends became evident. Some agencies had accepted the scribing-on-coated-plastic technique as simply a successor to conventional ink drafting. Their engravers were looked upon as practitioners of cartographic skills. A different viewpoint was taken by others, who saw the engraving technique as an integral part of the lithographic-negative-preparation process, and organized their scribing activities accordingly. As a step in the study and clarification of all the variations in application and policy, the Bureau of the Budget invited Federal mapping and charting agencies to appoint representatives to a committee aimed at achieving such correlation, and thus the Interagency Committee on Negative Scribing began.

The following agencies have pooled information and worked together to organize and present the data accumulated:

Aeronautical Chart and Information Center
Army Map Service
Coast and Geodetic Survey
Engineer Research and Development Laboratories
Forest Service
Geological Survey
Navy Hydrographic Office
Soil Conservation Service
Tennessee Valley Authority

* Cartographer, Charting Techniques Office, Cartography Division, Aeronautical Chart and Information Center.

Representatives of these agencies have met many times since the first gathering on the 23rd of February, 1954, and are still regularly doing so, as of course they will until the entire report is completed and published. The writer has had the pleasure of working closely with the ACIC contingent, whence derives his acquaintance with the program.

Although the "Scribing Report" is in three separate sections, or chapters—it is really a single, integrated work. It is, therefore, hoped that it will eventually appear within one cover, or so prepared that it may be assembled into one volume. It has been thought most useful to publish each part as rapidly as it is ready, rather than to wait until all are ready. Briefly, the coverage of the three chapters is as follows:

CHAPTER I

This is the general, introductory, and definitive treatment of the subject. The broad history, and concept, of negative scribing are discussed. The basic instruments are described and illustrated, and their uses outlined. A typical work-flow diagram is included. Indeed, if the descriptions and illustrations in this chapter appear elementary to the initiated, it must be borne in mind that this is a general treatment. Everything here is typical, *not* specific. In this chapter are set forth the basic origins, advantages, and applications of scribing. A bibliography of source information is given for the benefit of those wishing to delve deeper into the existing literature.

CHAPTER II

Whereas Chapter I is general, Chapter II is specific. Herein the individual agencies get down to their own cases, and explain in detail how they have adapted scribing to their own particular circumstances. A great deal of the "protein" of the "Scribing Report" is in this chapter. While those who do not now utilize this highly efficient medium may have discovered, in Chapter I, that it could be to their advantage to adopt it, they should, in Chapter II, find clues to applications directly fitting their own situations.

Variations in instrument design will be found, as well as variations in organizational approach. Some will engrave only color separations, using the scribed sheets as negatives from which to make offset printing plates. Others will prepare compilations, or partly so, with the scribing needle.

CHAPTER III

As with all infants, negative scribing has ancestors. As an offspring of the graphic arts, chemistry, plastics, traditional lithography, and ink drafting, it derived or borrowed terminology from its forebears. In some places called "negative engraving", it is in others known as "negative scribing", and also simply and familiary as "scribing".

No words were in existence to define the operations of the new concept in its own right. The borrowed and adapted terms have not been fully adequate, nor have they been universally recognized by all users. Since, within the same organization, such expressions as "left-reading" and "wrong-reading" might give rise to confusion, it is no wonder that misinterpretation can exist among the separated groups of users. The need for a glossary was therefore early recognized by the Committee. This is Chapter III, and its publication may be expected in the very near future.

All three chapters, considered as a unit, may be said to contain the substance of negative scribing as it is practiced in the major Federal mapping and charting agencies of the United States today.

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Accuracy over Short Distances with the Model 4 Geodimeter

By MILTON E. COMPTON

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GEODIMETERS for the accurate determination of distances in surveying have been available since 1952. The initial design was directed at the small geodetic group in every country responsible for the establishment of primary geodetic control. By beginning with the most costly design, maximum accuracy could be coupled with maximum range. Later, this tried and proven design might be scaled down to meet the larger market demand of portability and cost.

This has been successfully done. The first-order base line Geodimeters are in use in the United States, Canada, Denmark, Indonesia, Australia, Japan, Holland, and Sweden. Users of the Geodimeter have been enthusiastic. Like any new device requiring understanding and tolerance in early models, adjustments have been required and improvements incorporated. Shipping by commercial carriers has been a problem in the United States, but that has been corrected by the use of new cases.

The larger type has been redesigned into the smaller Model 3 Geodimeter which is being delivered to customers. It was introduced to the American Congress on Surveying and Mapping in 1956.

You will recall that the Model 3 weighs 50 pounds, about one quarter the weight of the geodetic base line Model 2 Geodimeter and still has a maximum range of the order of 20 miles with a mean error of ± 4 inches.

Field calibration of equipment is not required for normal use, but if applied, reduces the mean error of ± 2 inches at any distance measured. Triangulation arc lengths, picture points, and traverse are the functions of the Model 3 and long or short accurate lines can be established at a quantity rate per day, since measurement time is less than one hour.

Measurements over three first-order base lines in the United States indicate the Model 3 will exceed its design accuracy.

Model 2 and Model 3 Geodimeters now being "stock" items, we have directed our design at the practicing surveyor.

The basic Geodimeter design has been again scaled down to approach the size of the theodolites and transits now in use. This newest Geodimeter is called "The Model 4."

As in the other Geodimeter models, there are transmitter and receiver optics. Light modulated or "blinked" at 30 million times per second is sent to a passive reflector that requires little orientation and no attendant. Horizontal and vertical circles are provided for approximate angles. At the completion of a distance measurement, the Model 4 is removed from the tripod and replaced by a standard theodolite for precise angle measurements. Existing angle measuring instruments in the surveying parties make it uneconomical to combine accurate angle measurements in the Model 4.

Laboratory tests with this prototype show that the range will be from 300 feet to 2 miles. Instrumental mean error will be about one inch. Accuracy ratio will exceed 1/50,000 at 1 mile and will be about 1/5,000 at 300 feet. Shorter distances are, of course, possible, but conventional taping may be faster at distances less than 300 feet.

The measuring time is of the order of 10 minutes. The measured distance being determined immediately from the instrument panel with the use of precomputed tables.

The final size will be slightly less than

Presented at the Seventeenth Annual Meeting of the American Congress on Surveying and Mapping, Washington, D. C., March 6–8, 1957.

that of the prototype and the weight will be about 25 pounds.

Power required is about 40 watts which is the same as that required by an automobile radio. Either a small 115 volt–60 cycle generator or an automobile battery can be used.

The reflector required is the "corner cube" prism that is light in weight and uncritical in pointing. Many such reflectors can be placed at desired points and distances measured without changing the setup of the Model 4.

Traverse will be the large application of the Model 4 and, with its inherent accuracy, position determinations will be easier and more precise than by triangulation.

Meteorological and ground conditions will not introduce errors in the measured distance. A small but correctable effect upon the velocity of propagation of the light is caused by temperature and pressure, but a measurement or estimate of these values at the Model 4 site removes this error. Humidity will not change the velocity of light by more than one part in a million under the most extreme conditions and hence is without consequence in the Model 3 and Model 4 Geodimeters.

The final cost has not been determined since it is a function of the number of units produced. We estimate the cost at between $3,000 and $4,500 and hope it may be offered toward the lower end of this range.

It is expected that production Model 4 Geodimeters will be available at the next ACSM meeting.

The practicing surveyor will soon have, for the first time, an instrument for distance measurements that will complement his angular equipment, reduce his costs, and greatly accelerate his mapping potentialities.

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State, County, and Municipal Agencies for Planning and Integration of Mapping Activities

EDITOR'S NOTE.—In similar letters to ACSM and to the Map Information Office of the U. S. Geological Survey, Waldo R. Tobler of the Department of Geography, University of Washington, requested information concerning the names and addresses of the recognized agencies charged with the planning and integration of mapping activities in each of the 48 States. Recognizing that some States do not have such agencies, but have the responsibility divided among various departments, Mr. Tobler indicated that the names and addresses of the most active in the field would be an adequate substitute. Mr. Tobler's request evidently stems—and naturally enough—from successful use of the recently formed Washington State Bureau of Surveys and Maps.

So far as is known, Washington and Maryland are the only two States with such centralized bureaus, although the East Bay Council on Surveying and Mapping in the San Francisco Bay area must not be overlooked on the local level.

Daniel Kennedy, Acting Chief Topographic Engineer, U. S. Geological Survey, replied to Mr. Tobler's letter, enclosing (1) a list of State, county, and municipal agencies with which the USGS has cooperative agreements for topographic mapping, and (2) a list of the Chairmen, State Mapping Advisory Committees.

ACSM President Robert H. Lyddan and Secretary Walter S. Dix, and others in ACSM's Topography Division, realizing immediately that this information would be of considerable interest to many members of ACSM, have recommended that the lists be published in SURVEYING AND MAPPING. Accordingly the two lists are given below.

It is not pretended that these lists give the names of *all* agencies, commissions, and committees charged with planning and integration of mapping activities. Doubtless there are many such organizations on the county and municipal level which are not listed.

STATE, COUNTY, AND MUNICIPAL AGENCIES CURRENTLY PARTICIPATING IN COOPERATIVE AGREEMENTS WITH USGS FOR TOPOGRAPHIC MAPPING

Arkansas

Arkansas Geological and Conservation Commission, Little Rock

California

State Department of Water Resources, Sacramento

Colorado

Colorado State Metal Mining Fund, 204 State Office Bldg., Denver

Connecticut

State Highway Department, Hartford

Georgia

State Division of Conservation, Department of Mines, Mining, and Geology, Agriculture Laboratory Bldg., 19 Hunter St., SW, Atlanta 3

Commissioner of Roads and Revenues, DeKalb County, Decatur

Board of Commissioners, Fulton County, Atlanta

Illinois

State Department of Registration and Education, Geological Survey Division, 121 Natural Resources Bldg., University of Illinois, Urbana

Indiana

Division of Water Resources, Indianapolis

Iowa

City of Des Moines, Des Moines

Iowa Geological Survey, Geology Annex, Iowa City

Kansas

State Geological Survey of Kansas, University of Kansas, Lawrence

State Highway Commission, Topeka

Kentucky

State Department of Economic Development, Division of Maps and Minerals, Frankfort

Louisiana

State Department of Public Works, Baton Rouge

Maine

Maine Public Utilities Commission, Augusta

Massachusetts

State Department of Public Works, 100 Nashua St., Boston

Michigan

State Highway Department, Lansing

Minnesota

Iron Range Resources and Rehabilitation Commission, 624 State Office Bldg., St. Paul

State Department of Conservation, State Office Bldg., St. Paul

Missouri

Missouri Geological Survey and Water Resources, Box 250, Buehler Bldg., Rolla

Nevada

Nevada Bureau of Mines, University of Nevada, Reno

New York

State Department of Public Works, Albany

North Dakota

State Water Conservation Commission, Bismarck

Ohio

State Department of Natural Resources, Division of Geological Survey, Rm. 106, Orton Hall, Ohio State University, Columbus

Summit County Commissioners, Akron

Oklahoma

Director of Public Works, 302 Municipal Bldg., Oklahoma City

Tulsa Metropolitan-Area Planning Commission, 406 South Denver St., Tulsa

Pennsylvania

Bureau of Topographic and Geologic Survey, Harrisburg

Puerto Rico

Department of Public Works, San Juan

Tennessee

Tennessee Department of Conservation, Division of Geology, G-5 State Office Bldg., Nashville

Texas

City of Austin, Austin

Lower Colorado River Authority, Austin

Vermont

Vermont Development Commission, University of Vermont, East Hall, Burlington

Virginia

Department of Conservation and Development, Division of Geology, P. O. Box 3667, University Station, Charlottesville

Washington

State Department of Conservation and Development, Division of Mines and Geology, 335 General Administration Bldg., Olympia

West Virginia

State Geological and Economic Survey, P. O. Box 879, Morgantown

Wisconsin

State Conservation Department, Madison

State Highway Commission, Madison

Geological and Natural History Survey, University of Wisconsin, Science Hall, Madison

Wyoming

State Engineer's Office, Capitol Bldg., Cheyenne

CHAIRMEN OF MAPPING ADVISORY COMMITTEES

Florida

Mr. Jon S. Beazley, Traffic & Planning Division, State Road Department of Florida, Tallahassee

Indiana

Mr. C. H. Bechert, Division of Water Resources, Department of Conservation, Indianapolis

Kansas

Dr. Frank C. Foley, Director and State Geologist, University of Kansas, Lawrence

Maine

Mr. Austin H. Wilkins, Deputy Forest Commissioner, Forest Service, Augusta

Minnesota

Dr. G. M. Schwartz, Director, Minnesota Geological Survey, University of Minnesota, Minneapolis

Mississippi

Dr. Wm. C. Morse, Director, Mississippi State Geological Survey, University of Mississippi, University

Montana

Dr. A. E. Adami, Montana School of Mines, Butte

Nevada

Mr. Hugh A. Shamberger, State Engineer, State of Nevada, Carson City

New Hampshire

Alice Cosgrove, Planning and Development Commission, Concord

New Mexico

Mr. C. B. Thompson, State Engineers Office, Sante Fe

Oregon

Mr. Fay W. Libbey, Director, State Department of Geology and Mineral Industries, 1069 State Office Bldg., Portland

South Carolina

Mr. Ralph M. Horton, Jr., Chief of Research, State Development Board, Columbia

Texas

Mr. H. A. Beckwith, Board of Water Engineers, 302 W. 15th St., Austin

Vermont

Mr. Emerson Baker, Department of Highways, Montpelier

West Virginia

Dr. Paul H. Price, Director, State Geological and Economic Survey, P. O. Box 879, Morgantown

Wisconsin

Mr. George F. Hanson, State Geologist, Science Hall, University of Wisconsin, Madison

Wyoming

Mr. L. C. Bishop, State Engineer, Capitol Bldg., Cheyenne

NOTE: Mapping Advisory Committees have not actually been formed in the States of Washington and Pennsylvania, but a canvass of State needs has been made in each case. The persons who coordinated the requests were:

Washington

Mr. Sheldon Glover, Supervisor, Division of Mines and Geology, Department of Conservation and Development, Olympia

Pennsylvania

Dr. Carlyle Gray, State Geologist, Bureau of Topographic and Geologic Survey, Harrisburg

Fourth Congress of the Institution of Surveyors, Australia

The Fourth Congress of the Institution of Surveyors, Australia, will be held in Brisbane, May 24–30, 1958.

The Australian Institution extends cordial welcome to any member or representative of the American Congress on Surveying and Mapping to attend, and, further, invites participation. Any member preparing to read a technical paper at the Australian Congress is requested to submit a copy of the paper to the Institution at an early date. Hotel bookings for the Congress dates or for an extended stay, either in Brisbane or at some holiday resort, may be arranged by writing the Secretary, Institution of Surveyors, Australia, 166 Ann Street, Brisbane, Australia.

ACSM Members contemplating attendance at the Brisbane meeting in 1958 are asked to also notify ACSM Secretary as soon as possible. Anyone planning participation is asked to also file a copy of the prepared paper with ACSM as far in advance as possible, for the official records.

—WALTER S. DIX
Executive Secretary, ACSM

Mineral Map of Ontario

A mineral map of Ontario has been completed by the Cartography Section of the Ontario Department of Mines. It is believed to be the largest map of the entire Province ever to be printed on a single sheet. Drawn on the scale of one inch to 20 miles, the map measures 50″ by 53″, and the sheet on which it appears is 53″ by 60″.

On it there are about 15,000 names, including those of all townships in the Province. The map, printed in eight colors, shows the basic geology of the Province and the locations of the principal mines and mineral occurrences.

Enlarged inset maps show in detail the principal mining camps, the natural gas and oil fields of Southwestern Ontario, the location of metallurgical works in the Province, and the various offices of the Department of Mines.

Mines and mineral occurrences are indexed by mining divisions, and other tables show the value of production of individual minerals and of separate mining areas.

Hon. J. W. Spooner, Minister of Mines, says that publication of the map was timed to coincide with the Sixth Commonwealth Mining and Metallurgical Congress which toured Canada during September 1957.

The map, available through the publications office of the department, is being sold for $1.00 per copy.

Surveying and Mapping News

Members are requested to send in surveying and mapping news items for publication in SURVEYING AND MAPPING.—EDITOR.

General Interest

OPERATIONS OF THE CANADIAN HYDROGRAPHIC SERVICE, A SYMPOSIUM. *The Canadian Surveyor*, Vol. 13, No. 6, January 1957. (Papers presented at the third of a series of meetings sponsored by the Canadian Institute of Surveying and Photogrammetry, including "Hydrographic Field Operations" by H. R. Blandford, and "Nautical Chart Cartography" by E. M. Walsh.)

STATISTICAL TESTING OF REGIONAL BOUNDARIES. Leonard Zobler. *Annals of the Association of American Geographers*, Vol. 47, No. 1, March 1957. (Of interest to engineers, surveyors, and cartographers concerned with regional planning as well as to geographers.)

GEOLOGY AND RELATED ENGINEERING PROBLEMS AT THULE, GREENLAND. Helgi Johnson. *Transactions of the New York Academy of Sciences*, Series II, Vol. 19, No. 7, May 1957. (Concise description of the geology of the area and its bearing on the problems involved in the construction of a major air base.)

THE ENGINEER THROUGH THE AGES; THE GREEK ARCHITEKTON, PART 1. J. K. Finch. *Civil Engineering*, Vol. 27, No. 5, May 1957. (Historical account of ancient surveying and engineering techniques.)

THE ESTABLISHMENT OF KWINANA TOWNSITE INDUSTRIAL AREA AND PORT. W. F. Fyfe. *The Australian Surveyor*, Vol. 16, No. 6, June 1957. (Discussion includes account of the surveying and mapping essential to the project.)

NAUTICAL CHARTING (1807–1957). Aaron L. Shalowitz. *The Scientific Monthly*, Vol. 84, No. 6, June 1957. (Review of the work of the Coast and Geodetic Survey in its sesquicentennial year.)

MEASURING THE WORLD RECORD AIR SPEED. Bert Watts. *Empire Survey Review*, Vol. 14, No. 105, July 1957. (Application of survey methods to aircraft speed test.)

THE START OF THE INTERNATIONAL GEOPHYSICAL YEAR. Editorial. *Endeavour*, Vol. 16, No. 63, July 1957.

WHERE SHERMAN PASSED BY. D. J. de Laubenfels. *Geographical Review*, Vol. 47, No. 3, July 1957. (Comparison of landscape along a traverse made by an Army captain during Sherman's march with present day features.)

CANALS THROUGH THE AGES. C. J. Merdinger. *The Military Engineer*, Vol. 49, No. 330, July-August 1957. (Part I of a series on the engineering and development of canals from the earliest times to the present.)

NBS PARTICIPATION IN THE INTERNATIONAL GEOPHYSICAL YEAR. (No author given.) *National Bureau of Standards Technical News Bulletin*, Vol. 41, No. 9, September 1957. (Outlines various programs to be undertaken during 1957–58.)

Control Surveys

AN ANALYTICAL TREATMENT OF THE PROBLEM OF TRIANGULATION BY STEREOPHOTOGRAMMETRY. Dr. Ing. Hellmut Schmidt, Geodesist, Ballistic Research Laboratories, Aberdeen Proving Ground, Maryland. *Photogrammetria*, Vol. 13, No. 2, 1956–1957. (Detailed discussion with geometrical analysis and formulae.)

AZIMUTH DETERMINATION BY ASTRONOMIC TRANSIT. R. K. C. Johns. *The Canadian Surveyor*, Vol. 13, No. 6, January 1957. (Describes new method for increasing the accuracy of observations on Polaris at high latitudes.)

APPLICATION OF SHORAN TO ESTABLISH HORIZONTAL CONTROL FOR PHOTOGRAMMETRIC MAPPING OF INACCESSIBLE AREAS. Dr. J. M. Zarzycki. *The Canadian Surveyor*, Vol. 13, No. 6, January 1957. (Describes in detail methods employed in aerial mapping of Northern Canada.)

COMPUTATION OF TRIANGULATIONS ON THE ELLIPSOID BY THE AID OF CLOSED FORMULAS. R. A. Hirvonen. *Bulletin Geodesique*, Nouvelle serie, Annee 1957, No. 43, 1*er* Mars 1957. (Mathematical discussion in English.)

SOME REMARKS ON THE COMPUTATION AND ADJUSTMENT OF LARGE SYSTEMS OF GEODETIC TRIANGULATION. W. Baarda. *Bulletin Geodesique*, Nouvelle serie, Annee 1957, No. 43, 1*er* Mars 1957. (Mathematical discussion with formulae and tables.)

SURVEY TECHNIQUES: CONCEPTS OF YESTERDAY, TODAY, AND TOMORROW. Colonel Melvin C. Shetler. *The Military Engineer*, Vol. 49, No. 328, March–April 1957. (Illustrated discussion of the development of modern surveying procedures over the past decade.)

LAYING OUT TRUE MERIDIANS IN DEFENSE PLANTS. Henry F. Soehngen. *Civil Engineer-*

ing, Vol. 27, No. 5, May 1957. (Application of precise surveys in the placing of true meridian lines inside defense plants and laboratories to help the testing of weapon components.)

REDUCTION TO MERIDIAN OF CIRCUM-MERIDIAN OBSERVATIONS. R. D. FitzGerals. *The Australian Surveyor*, Vol. 16, No. 6, June 1957. (Illustrated by formulae and graphs.)

THE NEW MAPPING METHODS. Carl I. Aslakson. *The Australian Surveyor*, Vol. 16, No. 6, June 1957. (Deals primarily with electronic survey principles.)

A NOTE ON THE FIELD RECEPTION OF TIME SIGNALS. A. R. Robbins. *Empire Survey Review*, Vol. 14, No. 105, July 1957. (Technical discussion of the use of time signals in surveying.)

THE USE OF SENSITIVE PRESSURE DEVICES IN SURVEYING. Desmond O'Connor. *Empire Survey Review*, Vol. 14, No. 105, July 1957. (Continuation of an article previously reported upon.)

THE TELLUROMETER SYSTEM OF DISTANCE MEASUREMENT. T. L. Wadley. *Empire Survey Review*, Vol. 14, No. 105, July 1957. (Describes instrument and gives an account of field tests and performance.)

MODERN SURVEYING TECHNIQUES. Col. J. D. Abell. *The Military Engineer*, Vol. 49, No. 330, July–August 1957. (Discussion of modern techniques and instruments, many of which were developed during and after World War II.)

SOME COMMENTS ON THE RESULTS OBTAINED WITH THE CAMBRIDGE PENDULUM APPARATUS IN NORTH AMERICA. R. L. G. Gilbert. *Transactions American Geophysical Union*, Vol. 38, No. 4, August 1957. (Suggests possible causes for discrepancy between North American and British gravity calibrations along same base lines.)

MIT'S NEW HIGHWAY DESIGN METHOD. Unsigned feature article in *Engineering News-Record*, September 5, 1957. (Describes prototype setup of a new method of mechanized highway design.)

Instruments

POSTWAR DEVELOPMENTS IN GEOPHYSICAL INSTRUMENTATION FOR OIL PROSPECTING. D. T. Germain-Jones. *Journal of Scientific Instruments*, Vol. 34, No. 1, January 1957. (Review of progress in development of instruments for geophysical prospecting.)

THE ASKANIA ONE-SECOND THEODOLITE TYPE TU. Presentation by Askania-Werke A. G., Bambergwerke, West Berlin. *Bulletin Geodesique*, Nouvelle serie, Annee 1957. No. 43, 1*er* Mars 1957. (Detailed description of new instrument.)

HORIZON CAMERA CAN AID PLANETABLE SURVEYS. New Products Section, *Engineering News Record*, Vol. 158, No. 21, May 23, 1957. (Describes new camera developed to record vertical and horizontal images on 35 mm film over a 360° horizon.)

DIGITAL COMPUTERS USED BY THE CORPS OF ENGINEERS. Major Charles J. Davis. *The Military Engineer*, Vol. 49, No. 329, May–June 1957. (Description of types and uses, with a listing of manufacturers and costs.)

THE "TELLUROMETER" MICRO-WAVE DISTANCE MEASURING EQUIPMENT. No author given. *The Australian Surveyor*, Vol. 16, No. 6, June 1957. (Brief discussion of the instrument and its capabilities.)

LEVEL VIALS—THEIR MANUFACTURE, USE, AND PECULIARITIES. Douglas L. Parkhurst. *Journal of the Franklin Institute*, Vol. 264, No. 2, August 1957. (Illustrated description of the manufacture and testing of precision level vials.)

HOW F8U-1P PHOTOGRAPHED U. S. AT M 1.1. George L. Christian. *Aviation Week*, Vol. 67, No. 6, August 12, 1957. (Describes a coast-to-coast aerial mapping survey.)

Property Surveys

PRE-BUILDING GROWTH PATTERNS OF CHICAGO. Jerome D. Fellman. *Annals of the Association of American Geographers*, Vol. 47, No. 1, March 1957. (Comprehensive study of the history of Chicago's growth through subdivision, resubdivision, lot sales, development of transportation, and other factors, illustrated by maps in series and special maps.)

CADASTRAL SURVEYS IN THE MIDDLE EAST. H. G. Dawe. *The Canadian Surveyor*, Vol. 13, No. 6, January 1957. (Description of techniques employed to overcome unusual difficulties posed by terrain conditions.)

Topography

LANDFORMS AND TOPOGRAPHY OF THE LAKE MELVILLE AREA, LABRADOR, NEWFOUNDLAND. Weston Blake, Jr. *Geographical Bulletin*, Geographical Branch, Department of Mines and Technical Surveys, Ottawa, Canada, No. 9, 1956.

MAPPING THE ISLAND OF NEWFOUNDLAND. S. G. Gamble. *The Canadian Surveyor*, Vol. 13, No. 6, January 1957. (Provides historical background and discussion of methods and achievements.)

MORE PHOTOGRAMMETRIC RESEARCH NEEDED. Charles L. Miller. *Civil Engineering*, Vol. 27, No. 6, June 1957. (Summary of paper presented at the ASCE Jackson convention.)

PHOTOGRAMMETRY FOR THE HIGHWAY ENGINEER. A. O. Quinn. *Civil Engineering*, Vol. 27, No. 6, June 1957. (The Chief Engineer, Aero Service Corporation, discusses the increasing importance of photogrammetric techniques in connection with the huge national highway program.)

MAPPING SURVEY OF THAILAND. Major Gordon L. Smith. *The Military Engineer*, Vol. 49, No. 329, May–June 1957. (Detailed account of a difficult surveying and mapping operation.)

BOOKS AND PAMPHLETS

WHERE IN THE WORLD WILL YOU FOLLOW YOUR ENGINEERING PROFESSION? CALIFORNIA OFFERS YOU UNLIMITED ENGINEERING OPPORTUNITIES. California, Department of Public Works, Division of Highways. Sacramento (no date), 15 pp. illus.

UNDERSTANDING MAPS: CHARTING THE LAND, SEA AND SKY. Beulah Tannenbaum and Myra Stillman. McGraw-Hill, 144 pp., illus. $2.75.

SURVEYING TABLES AND GRAPHS. U. S. Department of the Army, Washington, G.P.O. 1955. 646 pp. (TM 5-236.)

BOARD OF PROFESSIONAL ENGINEERS AND LAND SURVEYORS, JERSEY CITY. Roster of professional engineers and land surveyors. Newark, 1956. 141 pp.

REGISTERED PROFESSIONAL ENGINEERS AND LAND SURVEYORS AND LAW GOVERNING THE PRACTICE OF PROFESSIONAL ENGINEERING AND LAND SURVEYING IN GEORGIA. Board of Registration for Professional Engineers and Land Surveyors. Atlanta, 1956. 114 pp.

ROSTER. District of Columbia, Board of Registration for Professional Engineers. Washington, 1956, 89 pp.

ELECTRONIC MEASUREMENTS AND MEASURING INSTRUMENTS. F. G. Spreadbury. Constable and Co., Ltd., London, 1956. ix & 459 pp. Price 50s.

THE YEARBOOK OF REGISTERED ARCHITECTS AND SURVEYORS. Minnesota, Board of Registration for Architects, Engineers, and Land Surveyors. St. Paul, 1957, 85 pp.

REPORT OF THE LANDS SERVICE, YEAR ENDED DECEMBER 31st. 1956, PROVINCE OF BRITISH COLUMBIA, DEPARTMENT OF LANDS AND FORESTS. Victoria, British Columbia, 1957. 164 pp., illus., maps.

MONTHLY OPERATIONS REPORT. 30th Engineer Group (Topographic Survey.) Presidio of San Francisco, California. June 1957. 11 pp., 20 inclosures, tables, graphs, index maps.

CENTRO ARGENTINO DE CARTOGRAFIA, BUENOS AIRES. Publicaciones. Tomo I, Buenos Aires, 1957. 12 pp. (Review of mapping activities of the Argentine Cartographic Center. Spanish text.)

STATUS REPORT: METEOROLOGY, OCEANOGRAPHY & GLACIOLOGY. IGY Bulletin No. 2, August 1957. (Includes International Geophysical Year Calendar.)

STATUS REPORT: THE UPPER ATMOSPHERE PROGRAM. IGY Bulletin No. 3, September 1957.

FESTSCHRIFT ZUM 75 GEBURTSTAG VON PROF. C. F. BAESCHLIN. Orell Fussli Verlag, Zurich, 1957. 275 pp., tables, map. (Articles pertaining to geodesy, in German, French, and English.)

C. R. C. STANDARD MATHEMATICAL TABLES. 11th edition. Charles D. Hodgman, Editor-in-Chief. Chemical Rubber Publishing Company. 480 pp., $3.00.

THE SOLAR TRANSIT and THE HISTORY OF SOLAR SURVEYING INSTRUMENTS. Copies of very old pamphlets on the solar compass and solar transit with many good cuts and diagrams. (Educational and Historical.) Order from Stanley M. Weaver, C. E. & L. S., P. O. Box 326, Oroville, Washington. Both pamphlets for $1.00 post-paid.

SCIENTIFIC RESOURCES OF THE SAN FRANCISCO BAY AREA. International Science Foundation, California Academy of Sciences, Golden Gate Park, San Francisco 18, California. $5.00. (The 1957–58 edition of a publication which catalogues and describes the scientific and technological resources of the San Francisco Bay Area.)

GEODETIC OPERATIONS IN THE UNITED STATES AND IN OTHER AREAS THROUGH INTERNATIONAL COOPERATION JANUARY 1, 1954, TO DECEMBER 31, 1956. (Report to the International Association of Geodesy of the International Union of Geodesy and Geophysics, International Council of Scientific Unions) Department of Commerce, Coast and Geodetic Survey, Publication 60-1. For sale by the Superintendent of Documents, Government Printing Office, Washington 25, D. C. $0.25. (Contains progress maps and descriptive text concerning triangulation, trilateration, precise leveling, geodetic astronomy, and gravity stations for the period covered by the report. Of particular interest are the trilateration schemes from Baffin Island to Scotland and Norway, and from Puerto Rico to Trinidad.)

TIME SAVING TIPS FOR THE DRAFTSMAN AND THE ENGINEER. Frederick Post Company. Free. (A collection of 59 shortcuts to speed drafting and computation. Obtainable from Reader Service Division, Frederick Post Company, 3650 N. Avondale Ave., Chicago 18, Ill.)

SUCCESSFUL TEACHING WITH GLOBES. Denoyer-Geppert Company, 5235 Ravenswood Avenue, Chicago 40, Ill. $1.25. (A handbook designed to enable teachers to utilize world globes effectively in classroom instruction.)

—LYMAN D. LYNN
Coast and Geodetic Survey

DISTINCTIVE RECENT MAPS

The Oldest Map of the New World is the title of a colorful and attractive facsimile of a portion of the Juan de la Cosa Chart of 1500. It was reproduced by *American Heritage* magazine from the plate in Jomard's "Les Monuments dé la Geographie," Paris, 1862. The facsimile includes the western parts of Africa and Europe, the Atlantic Ocean, the coast of northeastern South America, and the West Indies, about one-fourth of the world map as laid down by La Cosa. It measures 15½ by 21½ inches. At the bottom of the map sheet there is a brief descriptive sketch giving the historical background and cartographical significance of the La Cosa map.

A colorful *Pictorial Map of the American Continent featuring the Pan American Highway* was published recently by Standard Oil Company (New Jersey), 30 Rockefeller Plaza, New York 20, N. Y. Prepared by General Drafting Company, the map is designed for free distribution to tourists and others interested in knowing more about the Americas. The map is at the approximate scale of 1:30,000,000 and measures 24 by 17 inches. It is decorated with numerous sketches illustrating the fauna, flora, history, resources, points of interest, and scenic centers of the several countries and regions. Brief descriptive sketches of the American countries are printed on the verso of the map.

Life in Colonial America from the Landing at Jamestown to the Revolution is an attractive and colorful map of the eastern half of the United States. It was prepared by General Drafting Company for distribution by the service station dealers of Esso Standard Oil Company. Vignettes, accompanied by brief text, locate and illustrate significant historical sites, personages, or events. An insert at the top of the map pictures "Famous flags of colonial America."

On the verso there are colored facsimiles of nine significant maps of seventeenth and eighteenth century America. The scale of the main map is approximately 1:3,500,000 and the map sheet measures 33½ by 24 inches.

Distribution of Negro Population by County 1950: Showing Each County with 500 or More Negro Population, is a colorful and informative map of the United States, copyrighted in 1956 by Samuel Fitzsimmons. It is at the approximate scale of 1:5,200,000 and measures 25 by 38 inches. The county outline base map is by the Bureau of Census, Department of Commerce, and data is from "General Characteristics of Population 1950," volume 2. Different colors identify counties with less than 500, 500–2499, 2500–9999, 10,000–24,999, 25,000–49,999, 50,000–99,999, and 100,000 and over, negro population.

The Pennsylvanian Geology of Cumberland Plateau is presented in a 21 page folio issued in 1956 by the Division of Geology, Tennessee Department of Conservation, Nashville. It was prepared by Charles W. Wilson, Jr., John W. Jewell, and Edward T. Luther. The geology is shown on four plates of the atlas at the scale of 1:190,000. A series of 8 "Isopach Maps," "Sand Distribution Maps," and structure maps fill 7 additional plates. The remaining pages of the folio are devoted to descriptive text, a "tabular stratigraphic sequence," economic geology summary, and a list of references.

A recent addition to the series of State maps being published by the Geological Survey is a new map of the *State of Arizona* at the scale of 1:500,000. It is available in a planimetric base map edition in three colors, and a nine color topographic edition which shows land forms, forest and recreation areas, Indian reservations, principal drainage features, county and State boundaries and county seats, and some of the more important geographic features. The planimetric edition is priced at one dollar per copy and the topographic edition is two dollars. Both maps measure 44 by 56 inches.

The Survey has also issued a new shaded relief map of Arizona. The skillful portrayal of relief effectively highlights the gorges of the Colorado, Bill Williams, Verde, Black, and Gila Rivers. The scale of the map is 1:500,000 and the size is 52 by 46 inches.

Kaart van Suriname (Netherlands Guiana) was prepared by K. N. Dahlberg and published by the Netherlands Topografische Dienst. It gives spot elevations and outlines major topographic features, locates inhabited places, mineral deposits, light houses, and airfields, and traces roads, railroads, and communication networks. The scale is 1:1,000,000 and the size 24 by 20 inches.

The railroad network of western Germany is shown on a map which carries the imposing title *Eisenbahnstrecken der Deutschen und der nichtbundeseigenen Eisenbahnen des öffentlichen Verkehrs.* It was published at Wuppertal in 1956. The scale is 1:1,500,000 and the measurements are 32 by 21 inches.

A four-sheet *Carte Morphologique du Bassin Parisian* is a recent publication of the Centre de Documentation Cartographique, Centre National de la Recherche Scientifique (Paris). It was prepared under the direction of M. A. Cholley, with the active collaboration of some 14 other French geographers and cartographers. Published at the scale of 1:400,000, the map shows hydrography, slopes, structural surfaces, erosion surfaces, old erosion surfaces, quaternary deposits, and tectonic features of France's Paris Basin. Each sheet of the map measures 26½ by 30½ inches.

A *Land Utilization Map of Cyprus* has been compiled under the direction of R. R. Rawson and K. R. Sealy in the Department of Geography, London School of Economics, with the assistance of W. J. Lorimer, A. D. Chaplin, D. C. Young, and D. Christodoulou. The map, which is at the scale of 1:250,000, was prepared from some 10,000 air photographs taken by the Royal Air Force.

The land is classified in nine groups in accordance with the classification proposed by the Old World Division of the World Land Use Survey. Crop land is divided into irrigated and unirrigated. The map measures 20½ by 32½ inches. It was published in 1956 for the World Land Use Survey, by Geographical Publications Ltd., London. The price is 3 shillings.

A *Tectonic Map of the U.S.S.R. and Adjacent Areas* (translated title) was published in 1956 by the Geological Institute, Akademie Nauk, S.S.R. It was compiled under the direction of N. S. Shataskin, with cartography by A. F. Semenov and geology by N. A. Goloshzhapov. This colorful map is printed on 9 sheets each of which measures 26 by 22 inches. The scale is 1:5,000,000.

The Tea Bureau has published a new map showing *Main Areas of Tea Production*. It embraces southern and southeastern Asia, Australasia, eastern Africa and the Middle East. Generalized relief is indicated by color gradients. Areas producing tea on large estates mainly for export, and those producing on scattered small holdings mainly for home consumption are identified. The scale of the main map is approximately 1:18,000,000 and it measures 19 by 29 inches. There is an enlarged inset map of Ceylon. The map is printed by George Philip & Son of London.

A *Pictorial Map of Himalayan Range and Surrounding Areas* presents the mountainous relief of that region by a combination of perspective sketching and color. Elevations of major peaks are given, and significant landmarks and tourist attractions are pictorially represented. The map, which is at the scale of 1:2,000,000, was drawn by Manmohan Dey and published by Vora & Company, Kalbadevi Road, Bombay 2, India. It measures 24 by 36 inches.

The Geological Survey of Korea and the Geological Society of Korea have collaborated to produce a new (1956) *Geologic Map of Korea* at the scale of 1:1,000,000. Nineteen different formations, ranging from Jurassic to Tertiary, are differentiated by color symbols. The map measures 46 by 32 inches.

A new and detailed map of Antarctica is the supplement to the September 1957 issue of the *National Geographic Magazine*. The map, at the scale of 1:7,000,000, was compiled to highlight current activities in Antarctica related to the International Geophysical Year. As noted in the *Geographic*, "For the first time a general map, based on current explorations, has been completed and published swiftly enough to be used on the scene by the explorers themselves."

There are 1,175 place names on the map, which is centered on the South Pole. An inset map outlines the segments of the continent claimed by different countries. The stories of earlier Antarctic explorations are summarized in 87 notes printed on the face of the map.

A map of Antarctica's *Ross Sea Region* is a 1956 publication of the Lands and Survey Department, Wellington, New Zealand. The scale of the main map is 1:4,000,000 at latitude 80 degrees south. There is an enlarged inset map of the McMurdo Sound region at the scale of 1:1,000,000. An inset of the entire continent and bordering waters is at the scale of 1:60,000,000. The two larger maps show definite and indefinite shorelines, ice shelves, glaciers, crevasses, disturbed ice, mountains, spot elevations, generalized contours, cliffs, and proposed bases for the International Geophysical Year.

—WALTER W. RISTOW
Library of Congress

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Books in Review

MODERN APPLIED PHOTOGRAPHY. G. A. Jones. *Philosophical Library, Inc.*, New York, 1957. 156 pages + 18 plates. $4.75.

This book is a comprehensive digest of the application of photography to the solution of scientific and engineering problems. The broad scope of this work prevents a thorough treatment of each application, but it does provide the protographer with considerable data.

The first chapter provides the background necessary for understanding the application of technical photography. The broad scope of this book can probably best be illustrated by stating the titles of its chapters: Photography as an Aid to Memory, Scientific Recording, Photography by Dim and Bright Light, Recording of Color, Infrared Sensitivity, Ultraviolet Photography, Radiography, Atomic Particles, Recording and Analysis of Motion, Photography in Production, and Photography as an Instructor. A subject index makes the book useful for reference purposes.

Four pages are devoted to the principles of photogrammetric mapping and the enumeration of tactical uses of aerial photography. An additional four pages explain the uses of photography in lithography and gravure, including map reproduction. The application of infrared photography for shoreline surveys is mentioned in connection with water depth determination and seaweed surveys.

This book appears to be written primarily for those engaged in solving scientific and industrial problems and is recommended reading for anyone who desires to be generally informed on modern scientific development.

WILLIAM D. HARRIS
Photogrammetry Division
Coast and Geodetic Survey

BOUNDARY CONTROL AND LEGAL PRINCIPLES. Curtis M. Brown. *John Wiley & Sons, Inc.*, New York, 1957. $7.50.

Boundary Control and Legal Principles is a timely contribution to much needed literature in the subject field. The development of the book from its forerunner *Boundary Control for Surveyors in California* and the background experiences of the author and his contributing associates leave little doubt that the book could well be a worthy and authoritative text for use in California and a good reference generally in the western areas of the United States—more so than in the eastern areas. Much of the text will be helpful to anyone anywhere in a general appreciation of a subject whose magnitude and complexity have been considerably over-simplified by condensation into 264 pages; a sacrifice to brevity at which your reviewer looks with alarm because the "watered down" coverage can be a dangerous hazard to the layman's or student's understanding of such a complex professional subject.

However, the author warns the reader in a brief Preface of the book's regrettable limitations and the flexibilities inherent with the law and its interpretations. In fact the book is dedicated to that authority and dean of title matters, William C. Wattles and his oft-repeated sage counsel—to most legal principles the statement "the contrary may be shown" should be added.

Thus, the *principles*, as set forth throughout the book, cannot and must not be considered rigid like a geometric theorem. Whereas in geometry one may take identical conditions and apply rigid principles and always get the same result; the application of physical mechanics to principles of jurisprudence—which surveying for real property boundary determination really is—does not always give equal results even under equal conditions. With this always in mind, or the dedication slogan "the contrary may be shown" applied to every *principle*, the book can prove a valuable reference.

This reviewer practices in an area where the political jurisdiction acquires fee simple title to roads dedicated in a subdivision and acquires fee simple title to many roads by direct deeds. The book, in describing the handling of these matters (e.g., pages 58, 98, and 110), is written expressly for those areas in which the public only acquires a "public easement" over a dedicated road; thus, many of the *principles* of Chapter 6 (Locating Reversion Rights) are affected and "the contrary is true."

Instances of technical incorrectness of some statements in the text were noted. An example of this is the sentence on page 12, "Within the United States magnetic north varies from 24 degrees east of north to 22 degrees west of north, a difference of 46 degrees." The question could well be asked as to what day of what year was this true. Also, the sentence on page

12 that contains the definition of a Deflection Angle as "that of sighting on a given line and turning the angle to another line." The reviewer could call this an interior or exterior angle; a defection angle is that obtained by sighting the prolongation of a given line and turning the angle to another line. Another sentence on page 15 could raise a question in some areas as it states, "A deed description based upon a Lambert bearing must be defined as such, otherwise true north may be implied." Unless otherwise stated, in some areas magnetic north is always assumed.

Some examples used in the text to illustrate points might have been better chosen. For example, a sentence on page 114 states: "In court cases certain things are presumed to be true until the contrary is proved; thus, if a letter is duly, written, sealed, addressed, stamped, and placed in a mail box, it is assumed to be delivered unless the contrary can be proved." It is noted here that the Post Office does a big business in "registered letters" and "return receipts" and it is generally true in court cases the sender must present proof that the letter was delivered to the addressee.

An example of a dangerous general-practice type statement is found on page 72. The sentence states, "The surveyor who is locating land from a title policy description need not devote research time to title matters other than that described or called for by the policy." In the few States in which the Torrens system is fully effective, this may be true. One needs but to note the high rates of commercial title policies to realize that they are dependent upon the individual examiner. Generally, then, it is safe to use a title policy, but one needs to keep constant vigil, for his responsibility is not limited to such a policy.

Many of the *principles* set forth in Chapter 4 apparently apply to subdivisions that are first laid on the ground and then platted. These *principles* may not apply to subdivisions that are computed and platted and then laid on the ground. The question of "intent" versus "errors in field monumentation" takes a more complex aspect. Also, the chapter sets up many *principles* dealing with "proration", but the text does not state when the surveyor has the legal right to prorate without the backing of a court order or the backing of all of the affected land owners.

Caution is advised by the reviewer on the use of some of the statements (or *principles*) made in the text for the reason that they are currently under study in various areas by various groups interested in professional conduct and practices. Examples of these questionable items in the text are: (page 89) "in the absence of an analysis showing the location of an error of closure, place the error of closure in the last course which states, thence to the point of beginning." (page 233) "To limit liability in a like manner, it is good form for the surveyor to state on his plat presented to the client 'for the exclusive use of John Doe.' "

Your reviewer would have preferred the text to delve in "Trespass Rights of Surveyors" in a more thorough manner than the short paragraph covering the subject on page 235. This paragraph does not distinguish that there are two types of trespass, civil and criminal. Many types of surveyors do enjoy criminal trespass rights, but none can enjoy civil trespass rights.

The last section of the book is entitled "Glossary of Deed Terms" and contains definitions of selected words. Brevity of the definitions as stated therein can lead the user to erroneous implications. For example, on page 259, the text notes " 'And assigns' is included in deeds to take care of corporations, trustees, etc., who cannot have heirs." Your reviewer feels that this could have been better stated by noting that the words "and assigns" are included to take care of any future grantee.

Your reviewer could go on and on, citing argumentative or "contrary showings." The danger of the book to the "student" surveyor is quite apparent when one remembers that this type of surveyor is usually not in a position to know which statements or *principles* might be applied for any given condition in any given area.

The book offers a provocative challenge to the experienced surveyor who after reading the book may feel insecure until he has refreshed his knowledge of the laws covering his areas of practice. The book will be a valuable addition to the professional surveyor's library.

VICTOR H. GHENT
Professional Engineer and Land Surveyor

MAKE YOUR PLANS NOW TO ATTEND THE 1958 ACSM–ASP COMBINED MEETINGS AND CO-EXHIBIT

MAP INFORMATION

This department was inaugurated for the purpose of bringing to the attention of the members information pertaining to the availability of maps, surveys, etc., with particular emphasis on how such material can be procured. It is believed that through an interchange and dissemination of such information maximum benefits will accrue to the surveying and mapping profession.

—EDITOR

Topographic Maps

THE FOLLOWING quadrangle maps were published or became available for distribution by the U. S. Geological Survey between June 1 and August 31, 1957. The list includes newly compiled maps; revised maps on which contours and drainage usually are unchanged but the works of man are brought up to date; and series-converted maps which are 15-minute maps produced from four 7½-minute maps of the same area. The maps are new unless otherwise designated by numerical superscript.

The quadrangle name (in capital letters) is followed by the name of the county (in upper- and lower-case letters) that contains the place or feature for which the quadrangle is named.

All maps are available with or without the green overprint that indicates woodland. These maps show the shape and elevation of the land surface (represented by contour lines, printed in brown); water features (in blue); works of man, including cities, towns, and scattered habitations, schools, churches, railroads, roads and boundaries, place and feature names (in black); and woodland areas (in green). Principal roads are shown by a red overprint. In areas that have been covered by Bureau of Land Management surveys, township and section lines are shown. The State rectangular coordinate and the U.T.M. 1,000-meter grid systems are indicated in the margins of the maps. An information folder further describing topographic maps is available on request.

Standard quadrangle maps may be obtained for 30 cents per copy. A discount of 20 percent is allowed on orders amounting to $10 or more at the retail price; a discount of 40 percent is allowed on orders amounting to $60 or more. Orders should be addressed to the U. S. Geological Survey, Washington 25, D. C., (or Denver 15, Colo., for maps of areas west of the Mississippi River).

* Indicates 15-minute quadrangles; all others are 7½-minute quadrangles.
[1] Indicates a revised map.
[2] Indicates a series-converted map.
† Indicates availability in either a contour or a shaded relief edition.
‡ Indicates preliminary black and white edition.

Alabama

CODEN—Mobile
KILLEN—Lauderdale
LEIGHTON—Colbert
POINT CLEAR—Baldwin
ROGERSVILLE—Lauderdale

Alabama-Tennessee

LEXINGTON—Lauderdale

Alaska

KANTISHNA RIVER (A-1)*—Fourth Judicial Division
KANTISHNA RIVER (A-2)*—Fourth Judicial Division
KANTISHNA RIVER (A-6)*—Fourth Judicial Division
KATEEL RIVER (A-1)*—Fourth Judicial Division
KETCHIKAN (A-6)*—First Judicial Division
NULATO (A-1)*—Fourth Judicial Division
NULATO (C-1)*—Fourth Judicial Division
NULATO (C-3)*—Fourth Judicial Division
NULATO (D-5)*—Fourth Judicial Division
PETERSBURG (C-2)*—First Judicial Division
PETERSBURG (C-4)*—First Judicial Division
RUBY (A-1)*—Fourth Judicial Division
RUBY (A-2)*—Fourth Judicial Division
RUBY (A-3)*—Fourth Judicial Division
RUBY (A-4)*—Fourth Judicial Division
RUBY (A-5)*—Fourth Judicial Division
RUBY (A-6)*—Fourth Judicial Division
RUBY (B-1)*—Fourth Judicial Division
RUBY (B-2)*—Fourth Judicial Division
RUBY (B-3)*—Fourth Judicial Division
RUBY (B-4)*—Fourth Judicial Division

RUBY (B-5)*—Fourth Judicial Division
RUBY (B-6)*—Fourth Judicial Division
RUBY (C-1)*—Fourth Judicial Division
RUBY (C-2)*—Fourth Judicial Division
RUBY (C-3)*—Fourth Judicial Division
RUBY (C-4)*—Fourth Judicial Division
RUBY (C-5)*—Fourth Judicial Division
RUBY (C-6)*—Fourth Judicial Division
RUBY (D-1)*—Fourth Judicial Division
RUBY (D-2)*—Fourth Judicial Division
RUBY (D-3)*—Fourth Judicial Division
SUMDUM (B-6)*—First Judicial Division
SUMDUM (C-6)*—First Judicial Division
SUMDUM (D-6)*—First Judicial Division
TELLER (C-1)*—Second Judicial Division
TELLER (C-2)*—Second Judicial Division
TELLER (C-3)*—Second Judicial Division
TELLER (C-5)*—Second Judicial Division
TELLER (C-6)*—Second Judicial Division
TELLER (C-7)*—Second Judicial Division
TELLER (D-1)*—Second Judicial Division
TELLER (D-2)*—Second Judicial Division
TELLER (D-3)*—Second Judicial Division
TELLER (D-4)*—Second Judicial Division
TELLER (D-5)*—Second Judicial Division
TELLER (D-6)*—Second Judicial Division

Arizona

‡BLACK FALLS 4 SW—Coconino
‡BLUE SPRINGS NE—Coconino
‡BLUE SPRINGS SE—Coconino
‡CAMERON NW—Coconino
‡CAMERON SW—Coconino
‡CHINLE 4 NE—Apache
‡CHINLE 4 SE—Apache
‡MOA AVE NW—Coconino
‡MOA AVE SW—Coconino

California

BLAIRSDEN*[1]—Plumas
BONANZA KING*—Trinity
BRADLEY*[2]—Monterey
BRYSON*[2]—Monterey
BURRIS PARK[1]—Kings
CAJON—San Bernardino
CALFLAX—Fresno
CHARLESTON SCHOOL—Merced
CHINA MTN.*—Siskiyou
COALINGA—Fresno
COIT RANCH—Fresno
CONDREY MTN.*—Siskiyou
CORCORAN[1]—Kings
DILLON MTN.*—Siskiyou
DONNER PASS*—Nevada
DURMID[1]—Riverside
HARPERS WELL—Imperial
HAWES*—San Bernardino
HELENDALE—San Bernardino
INDIAN GULCH*[1]—Mariposa
IRIS—Imperial
JOSHUA TREE*—San Bernardino
KANE SPRING—Imperial
KANE SPRING NE—Imperial
KANE SPRING NW—Imperial
KELSO*—San Bernardino
LEMOORE[1]—Kings
MESCAL RANGE*—San Bernardino
OWENS CREEK[1]—Mariposa
OXALIS—Fresno
PALOMAR MTN.*—San Diego
POINT SAL*[2]—Santa Barbara
POINT SUR—Monterey
REMNOY[1]—Kings
ROGERS LAKE*[1]—Kern
ROSAMOND*[1]—Kern
SALINAS*—Monterey
SALMON MTN.*—Siskiyou
SALTON—Riverside
SCOTT BAR*—Siskiyou
SEIAD VALLEY*—Siskiyou
SOBERANES POINT—Monterey
SODA LAKE*—San Bernardino
SOLEDAD—Monterery
SUCCESS—Tulare
TELEGRAPH PEAK—San Bernardino
THE DARK HOLE[1]—Fresno
THERMAL CANYON—Riverside
TRUCKHAVEN—Imperial
VALERIE—Riverside
WISTER—Imperial

California-Nevada

CLARK MTN.*—San Bernardino
HORSE THIEF SPRINGS*—San Bernardino
IVANPAH*—San Bernardino

Colorado

CAMEO—Mesa
ELKHORN—Park
IRONTON—Ouray
MESA—Mesa
SKYWAY—Mesa

Delaware

HARRINGTON—Kent
WYOMING—Kent

Delaware-Maryland

KENTON—Kent

Florida

ARCADIA SE—De Soto
BERMONT—Charlotte
CITRUS PARK—Hillsborough
CLEVELAND—Charlotte
COCKROACH BAY—Hillsborough
CREWSVILLE SW—Hardee
FORT OGDEN—De Soto
GANDY BRIDGE—Hillsborough
GROSSMAN HAMMOCK—Dade
LIMESTONE—Hardee
LONG ISLAND MARSH SW—De Soto
MURDOCK—Charlotte
MURDOCK NE—Charlotte
MURDOCK NW—Charlotte
MURDOCK SE—Charlotte
MYAKKA CITY—Manatee
MYAKKA CITY NW—Manatee
NOCATEE—De Soto
ORLANDO EAST—Orange
ORLANDO WEST—Orange
OVEIDO—Seminole
PASS-A-GRILLE BEACH—Pinellas
PORT TAMPA—Hillsborough
PUNTA GORDA SE—Charlotte
ROYAL PALM RANGER STA.—Dade
ROYAL PALM RANGER STA. SE—Dade
SOUTH MIAMI[1]—Dade
SPRINGFIELD[1]—Bay
ST. PETERSBURG—Pinellas
SWEETWATER—Hardee
TAMPA—Hillsborough
TELEGRAPH SWAMP—Charlotte
TELEGRAPH SWAMP NE—Charlotte
TELEGRAPH SWAMP NW—Charlotte
WINTER GARDEN—Orange

Florida-Georgia

HAVANA NORTH—Gadsden

Georgia

ACWORTH—Cobb
ALBANY EAST—Dougherty
MOUNTAIN PARK—Fulton
REDEN—De Kalb
SANDY SPRINGS—Fulton

Georgia-Florida

CALVARY—Grady
METCALF—Thomas

Georgia-South Carolina

PORT WENTWORTH—Chatham
SAVANNAH—Chatham

Hawaii

KAWAIHAE—Hawaii
KEAMUKU—Hawaii
MAKAHALAU—Hawaii
NAOHUELEELUA—Hawaii
NOHONAOHAE—Hawaii
PUU HINAI—Hawaii
PUU KOLI—Hawaii
UPPER PIIHONUA—Hawaii

Idaho

YANDELL SPRINGS*—Bingham

Illinois

ANDOVER—Henry
ANNAPOLIS*—Crawford
ATKINSON—Henry
CAMBRIDGE—Henry
EDGEWOOD*—Effingham
GALVA—Henry
GENESEO—Henry
GERMAN CORNER—Henry
GREEN ROCK—Henry
NEKOMA—Henry
NEWMAN*—Douglas
VILLA GROVE*—Douglas
WOODHULL—Henry

Illinois-Iowa

CLINTON—Clinton

Indiana

BROOKVILLE—Franklin
CLEVELAND—Hancock
EMINENCE—Morgan
GREENBRIER—Orange
KENT—Jefferson
LOOGOOTEE—Martin
METAMORA—Franklin
MORRISTOWN—Shelby
NEWPORT—Vermillion
WALDRON—Shelby

Kansas

ELLINWOOD NE—Barton
LELOUP—Franklin
OTTAWA NORTH—Franklin
POMONA*—Franklin
WELLSVILLE—Franklin
WICHITA EAST[1]—Sedgwick
WICHITA WEST[1]—Sedgwick

Kentucky

PANTHER[1]—Daviess

Louisiana

BASTROP*—Morehouse
BAYOU SALE*[1]—St. Mary
DE QUINCY*[2]—Calcasieu
HAILE*—Union
OYSTER BAYOU*—Terrebonne
SAREPTA*—Webster

Maine

BANGOR*[1]—Penobscot
BROOKS*[1]—Waldo
ORONO*[1]—Penobscot
PITTSFIELD*[1]—Somerset
STETSON*[1]—Penobscot

Maryland

JARRETTSVILLE—Harford

Massachusetts

WORTHINGTON[1]—Hampshire

Missouri

CAMBRIDGE—Saline
CARROLLTON WEST—Carroll
DUNCAN—Webster
FOREST GREEN—Chariton
GALENA—Stone

GARBER—Taney
GROVESPRING—Wright
HARTVILLE—Wright
HOLLISTER—Taney
HURLEY—Stone
KEYTESVILLE—Chariton
LAMPE—Stone
MINCY—Taney
RADER—Webster
REEDS SPRING—Stone
SALISBURY—Chariton
STOCKTON—Cedar
TABLE ROCK DAM—Taney

Missouri-Tennessee-Arkansas

CARUTHERSVILLE*[1]—Pemiscot

Montana

COMANCHE—Yellowstone
EMIGRANT*—Park
FRIDLEY PEAK*—Gallatin
GARNET MOUNTAIN*—Gallatin
PACKSADDLE BUTTE—Yellowstone
ROCK SPRING—Yellowstone
SANDBORN CREEK—Stillwater
WILDCAT DRAW—Stillwater

Nebraska

WELLFLEET NW—Lincoln
WELLFLEET SE—Lincoln

Nevada

POWELL MTN.*—Mineral

Nevada-California

ROACH LAKE*—Clark

New Jersey

AVALON—Cape May
GREEN BANK—Burlington
JENKINS—Burlington
PLAINFIELD[1]—Union

New Jersey-Delaware

FORTESCUE—Cumberland

New Jersey-New York

SOUTH AMBOY[1]—Middlesex

New Jersey-Pennsylvania

BRISTOL[1]—Bucks
PORTLAND[1]—Northampton

New Mexico

CEBOLLA*—Rio Arriba
DIAMOND A RANCH—Chaves
HOPE—Eddy
HOPE SE—Eddy
LLAVES*—Rio Arriba
TOOTH OF TIME*—Colfax

New Mexico-Colorado

CHAMA*—Rio Arriba

New York

ELIZABETHTOWN*—Essex
FREEPORT[1]—Nassau
HICKSVILLE[1]—Nassau
HOWELL POINT—Suffolk
LEE CENTER[1]—Oneida
MOUNT MARCY*—Essex
NEWCOMB*—Essex
ORISKANY[1]—Oneida
OWASCO[1]—Cayuga
PATTERSQUASH ISLAND—Suffolk
RAQUETTE LAKE*—Hamilton
SARANAC LAKE*—Franklin
SAYVILLE—Suffolk
SCIPIO CENTER—Cayuga
SEA CLIFF[1]—Nassau
SOUTH TRENTON[1]—Oneida
TUPPER LAKE*—St. Lawrence
UTICA WEST[1]—Oneida
VERNON[1]—Oneida
VERONA[1]—Oneida

North Carolina

ATKINSON*—Pander
BOLTON*—Columbus
CRESWELL—Washington
LEONARDS POINT—Washington
MOUNT GILEAD WEST—Montgomery
PIKE ROAD—Beaufort
WESTOVER—Washington
WHITEVILLE*—Columbus

North Dakota

BERLIN—La Moure
CARBURY—Bottineau
LAKE McARTHUR—Bottineau
METIGOSHE LAKE—Bottineau
SILVERLEAF—Dickey

Oklahoma

AMES*—Major
COLLINSVILLE—Tulsa
ENID*—Garfield
GARBER*—Garfield
HENNESSEY*—Kingfisher
MOORE*—Cleveland
OKLAHOMA CITY—Oklahoma
OKLAHOMA CITY*—Oklahoma
Oklahoma
OKLAHOMA CITY SE—Oklahoma
RINGWOOD*—Major

Oregon

CAMAS VALLEY*—Douglas
CHERRYVILLE*—Clackamas
ELKTON*—Douglas
HEBO*—Tillamook
ILLAHEE ROCK*—Douglas
IVERS PEAK*—Coos
NEHALEM*—Tillamook
QUARTZ MTN.*—Douglas
RED BUTTE*—Douglas
RUSTLER PEAK*—Jackson
SCOTTSBURG*—Douglas
SVENSEN*—Clatsop
TILLAMOOK*—Tillamook
TYEE*—Douglas

Oregon-California

HYATT RESERVOIR*—Jackson

Oregon-Washington

ST. HELENS*—Columbia

Pennsylvania

DOWINGTOWN—Chester
KIRKWOOD—Lancaster
MEDIA[1]—Delaware
MORGANTOWN—Berks
SYBERTSVILLE[2]—Luzerne

Pennsylvania-New Jersey

TRENTON WEST[1]—Mercer

Rhode Island

CROMPTON[1]—Kent

South Carolina

BLANEY—Kershaw
BLYTHEWOOD—Richland
CAMDEN SOUTH—Kershaw
CONGAREE—Richland
EASTOVER—Richland
EDISTO BEACH—Charleston
FORT JACKSON NORTH—Richland
FORT JACKSON SOUTH—Richland
GADSDEN—Richland
LEESBURG—Richland
LUGOFF—Kershaw
MESSERS POND—Richland
POINSETT STATE PARK—Sumter
REMBERT—Sumter
SAYLORS LAKE—Calhoun
ST. HELENA SOUND—Beaufort
ST. PHILLIPS ISLAND—Beaufort
WATEREE—Richland
WEDGEFIELD—Sumter

South Carolina-Georgia

LIMEHOUSE—Jasper

Tennessee

BUCKSNORT—Hickman
CENTERVILLE—Hickman
CRAIGFIELD—Williamson
DILLTON—Rutherford
FAIRVIEW—Williamson
GLADEVILLE—Wilson
LITTLELOT—Hickman
PRIMM SPRINGS—Hickman
SPOT—Hickman
WHITFIELD—Hickman

Texas

ADAMSVILLE—Lampasas
ALGOA[1]—Galveston
AMARILLO EAST—Potter
ARANSAS PASS*[2]—San Patricio
AXTELL—McLennan
BACLIFF[1]—Galveston
BROOKSHIRE*—Waller
CHEROKEE*[2]—San Saba
DICKINSON[1]—Galveston
EVANT—Coryell
FLAT TOP PEAK—Lampasas
FRIENDSWOOD[1]—Galveston
GUSTINE*[2]—Comanche
HAMILTON*[2]—Hamilton
HICO*[2]—Hamilton
IREDELL*[2]—Bosque
IZORO—Lampasas
JONESBORO*[2]—Coryell
JULIAN—Kenedy
KEMPNER—Lampasas
LA LEONA*[2]—Cameron
LAMPASAS—Lampasas
LA PORTE[1]—Harris
LIBERTY*—Liberty
MANVEL*[1]—Brazoria
MARIA ESTELLA WELL—Kenedy
MORGAN POINT—Harris
MOSHEIM*[2]—Bosque
PARK PLACE[1]—Harris
PEARL—Coryell
PITA CAMP—Kenedy
POTTSVILLE*[2]—Hamilton
RAYBURN*—Liberty
RUMLEY—Lampasas
SALTILLO WELL—Kenedy
SOUTH BIRD ISLAND*[2]—Kleburg

Texas-Oklahoma

HENRIETTA*—Clay

Utah

BEARS EARS*—San Juan
CLAY HILLS*—San Juan
FABLE VALLEY*—San Juan
LASAL JUNCTION*—San Juan
MT. LINNAEUS*—San Juan
MT. PENNELL*—Garfield
TEMPLE MTN.*—Emery
WAGON BOX MESA*—Garfield

Vermont

WILMINGTON*—Bennington

Virginia

BROOKNEAL*—Campbell

Washington

BASSETT JUNCTION—Grant
BELLINGHAM NORTH—Whatcom
GRISDALE*—Grays Harbor
LANGLEY—Island
LUMMI BAY—Whatcom
MAE—Grant
MONTESANO*—Grays Harbor
MOSES LAKE NW—Grant
WHEELER NE—Grant
WINCHESTER SE—Grant

Washington-Oregon

GRAYS RIVER*—Wahkiakum

Wisconsin

CUMBERLAND*—Barron
SEYMOUR*—Outagamie
WEBB LAKE*—Burnett

Wisconsin-Michigan

BOULDER JUNCTION*—Vilas

Wyoming

RATTLESNAKE PASS—Carbon

In addition to the standard series of quadrangle maps, small-scale (1:250,000) maps of areas in the United States and Territories are being published and distributed. They may be purchased from the Geological Survey for 50 cents per copy. An index to the series is available on request.

Alabama
BIRMINGHAM
MONTGOMERY

Alaska
KODIAK†

California
SAN LUIS OBISPO†

California-Nevada
WALKER LAKE†

Illinois-Indiana-Michigan
CHICAGO

Kansas
GOODLAND

Nebraska
BROKEN BOW

North Dakota
DICKINSON

Special metropolitan-area and vicinity maps of major United States cities are being published and distributed by the Geological Survey. These maps are prepared from standard 7½-minute maps at the scale of 1:24,000. Vicinity maps may be purchased from the Geological Survey for the prices indicated below.

CHICAGO AND VICINITY, Sheet 1 of 3 (Evanston), (48 by 72 inches) $1.50.

CHICAGO AND VICINITY, Sheet 2 of 3 (Chicago Loop), (48 by 72 inches) $1.50.

CHICAGO AND VICINITY, Sheet 3 of 3 (Blue Island), (48 by 72 inches) $1.50.

CINCINNATI AND VICINITY (50 by 72 inches) $1.50.

COLUMBUS AND VICINITY (39 by 53 inches) $1.50.

DAYTON AND VICINITY (49 by 58 inches) $1.50.

LITTLE ROCK AND VICINITY (35 by 40½ inches) $1.50.

LOUISVILLE AND VICINITY (40 by 46 inches) $1.50.

NEW HAVEN AND VICINITY (38 by 59 inches) $1.50.

WILMINGTON AND VICINITY (50 by 72 inches) $1.50.

Lake Survey Charts

PUBLICATION of new editions of the following Lake Survey Charts has been announced by the United States Lake Survey of the Corps of Engineers, U. S. Army. Copies of these charts may be obtained from the U. S. Lake Survey, 630 Federal Building, Detroit 26, Mich., at 75 cents per copy. Payment is required in advance by P. O. money order or draft, payable to the Treasurer of the United States. A catalog showing the areas described below is available free upon request.

37.—Coast Chart. Port Clinton, Ohio, and Colchester, Ont., to mouth of Detroit River at 1:80,000 scale. Inset: Port Clinton, Ohio, at 1:10,000 scale. (June 1957)

43.—St. Clair River, including St. Clair Flats and foot of Lake Huron at 1:40,000 scale. Inset: Head of St. Clair River at 1:15,000 scale. (July 1957)

701.—Coast Chart. Farnsworth Point, Mich., to 15 miles southwest of Escanaba, Mich., including Big Bay de Noc and Little Bay de Noc at 1:80,000 scale. Inset: Manistique, Michigan at 1:15,000 scale. (August 1957)

704.—Coast Chart. Beaver Island Group, Waugoshance Point, Mich., to Boulder Reef and north shore from Brevort, Mich., to Seul Choix Point, Mich., at 1:80,000 scale. Insets: Port Inland, Mich., at 1:10,000 scale; Beaver Harbor, Beaver Island, Mich., at 1:15,000 scale. (June 1957)

718.—Little Bay de Noc, including Escanaba and Gladstone, Mich., at 1:30,000 scale. (July 1957)

728.—Sturgeon Bay and Canal, Wis., at 1:30,000 scale. Inset: Sturgeon Bay, Wis., at 1:10,000 scale. (June 1957)

743.—Milwaukee Harbor, Wis., at 1:10,000 scale. (June 1957)

752.—Chicago Harbor, Ill., at 1:15,000 scale. (June 1957)

763.—Holland Harbor, Mich., and Lake Macatawa at 1:15,000 scale. (June 1957)

765.—Grand Haven, Mich., including Spring Lake and lower Grand River at 1:15,000 scale. (June 1957)

767.—Muskegon, Mich., and Muskegon Lake at 1:15,000 scale. (June 1957)

768.—White Lake, Mich., Whitehall and Montague, Mich., at 1:10,000 scale. (June 1957)

789.—Lake Charlevoix, Mich., at 1:30,000 scale. Inset: Charlevoix, Mich., at 1:10,000 scale. (June 1957)

Public Land Survey Plats

THE FOLLOWING plats of public land surveys and resurveys were completed and accepted by the Bureau of Land Management between June 1 and August 31, 1957. The class or purpose of the survey is indicated. Copies of plats may be secured from the Bureau offices in the States or from the Director, Bureau of Land Management, Department of the Interior, Washington 25, D. C.

Alaska—Seward Meridian
T. 16 N., R. 1 W.—Extension Survey
T. 16 N., R. 3 W.—Extension Survey
U. S. Survey 3367—Rabbit Townsite Addition, Fairbanks

Colorado—Sixth Principal Meridian
T. 5 N., R. 73 W.—Dependent Resurvey and Subdivision of Sections

Idaho—Boise Meridian
T. 8 S., R. 21 E.—(2) Supplemental Surveys
T. 9 S., R. 21 E.—Supplemental Surveys
T. 8 S., R. 25 E.—(5) Supplemental Surveys

Kansas—Sixth Principal Meridian
T. 14 S., R. 2 W.—Dependent Resurvey-Part
T. 15 S., R. 2 W.—Dependent Resurvey-Part
T. 16 S., R. 2 W.—Dependent Resurvey-Part
T. 14 S., R. 3 W.—Dependent Resurvey-Part
T. 15 S., R. 3 W.—Dependent Resurvey-Part
T. 17 S., R. 3 W.—Dependent Resurvey-Part
T. 17 S., R. 4 W.—Dependent Resurvey-Part
T. 18 S., R. 4 W.—Dependent Resurvey-Part
T. 17 S., R. 5 W.—Dependent Resurvey-Part
T. 16 S., R. 6 W.—Dependent Resurvey-Part
T. 17 S., R. 6 W.—Dependent Resurvey-Part

Louisiana—Louisiana Meridian
T. 23 S., R. 17 E.—Island Surveys

Mississippi—St. Stephens Meridian
Ts. 9 and 10 S., Rs. 4 and 5 W.—Resurvey and Extension Survey, Petit Bois Island

Montana—Principal Meridian
T. 16 N., R. 19 E.—Dependent Resurvey
T. 17 N., R. 19 E.—Dependent Resurvey
T. 26 N., R. 42 E.—Dependent Resurvey-Part
T. 26 N., R. 44 E.—Dependent Resurvey-Part
Ts. 7 and 8 N., R. 47 E.—Tract Surveys
T. 14 N., R. 9 W.—Small Tract Surveys
T. 14 N., R. 10 W.—Small Tract Surveys
T. 14 N., R. 11 W.—Small Tract Surveys
T. 4 S., R. 6 W.—Amended Dependent Resurvey

Nevada—Mt. Diablo Meridian
T. 5 S., R. 61 E.—Survey of Exteriors
T. 5 S., R. 63 E.—Survey of Exteriors
T. 6 S., R. 61 E.—Survey of Exteriors
T. 6 S., R. 62 E.—Survey of Exteriors
T. 6 S., R. 63 E.—Survey of Exteriors
T. 7 S., R. 62 E.—Survey of Exteriors
T. 7 S., R. 63 E.—Survey of Exteriors

New Mexico—New Mexico Principal Meridian
T. 21 S., R. 7 W.—Dependent Resurvey-Part
T. 21 S., R. 8 W.—Dependent Resurvey-Part

Utah—Salt Lake Meridian
T. 21 S., R. 9 E.—Skeleton Survey
T. 22 S., R. 9 E.—Skeleton Survey
T. 22 S., R. 10 E.—Skeleton Survey
T. 26 S., R. 5 E.—Skeleton Survey
T. 26 S., R. 8 E.—Skeleton Survey
T. 28 S., R. 5 E.—Skeleton Survey
T. 34 S., R. 12 E.—Skeleton Survey
T. 34 S., R. 13 E.—Skeleton Survey
T. 35 S., R. 12 E.—Skeleton Survey
T. 35 S., R. 13 E.—Skeleton Survey
T. 36 S., R. 16 E.—Skeleton Survey
T. 37 S., R. 15 E.—Skeleton Survey
T. 37 S., R. 16 E.—Skeleton Survey
T. 38 S., R. 15 E.—Skeleton Survey
T. 38 S., R. 16 E.—Skeleton Survey
T. 39 S., R. 14 E.—Skeleton Survey
T. 39 S., R. 15 E.—Skeleton Survey
T. 39 S., R. 16 E.—Skeleton Survey

Wyoming—Sixth Principal Meridian
T. 43 N., R. 67 W.—Dependent Resurvey-Part
T. 44 N., R. 67 W.—Dependent Resurvey-Part

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Comment and Discussion

The pages of SURVEYING AND MAPPING are open to a free and temperate discussion of all matters pertaining to the interests of the CONGRESS. It is the purpose of this Department to encourage comments and published material or the presentation of new ideas in an informal way.

—EDITOR

A.S.C.E. TASK COMMITTEE REPORT ON STATUS OF SURVEYING AND MAPPING

The letter which follows is reprinted from the May–June 1957 issue of *Field Notes*, the official publication of the Georgia Association of Registered Land Surveyors. The fact that it originally appeared in the Georgia publication is indicative of the widespread interest and concern which the Task Committee Report has created among surveyors and mappers. That the interest should be so widespread is both gratifying and fortunate, for the study is of such importance that no one connected with these professions can afford to ignore its potential.

The complete text of the committee report was reprinted on pages 203–205 of the April–June 1957 issue of SURVEYING AND MAPPING.

Chatfield Building
Thomaston, Georgia

All Registered Land Surveyors
(Specifically those not registered as
Civil Engineers)
Everywhere, U.S.A.

Dear Sirs:

Re: Registered Land Surveyors, Topography, Surveys—Engineering or Land? Civil Engineers, etc.

Awaken!

This issue, important to the registered land surveyors who are not also registered civil engineers, seems to be escaping the attention of those of us to whom it is most important.

In my position I see and hear of it enough that I cannot help but be concerned. The question of topography and surveyors is being debated, as are other topics of vital interest both to registered civil engineers and registered land surveyors. The result of these discussions will, in time, quite possibly become law. The law may then state that a surveyor will, or will not, be allowed to make topographic maps, and, quite possibly, other maps and surveys closely related, without violating the law.

I am concerned for the surveyor, not the engineer, simply because the question seems to be in reality, "Are surveyors qualified to make topographic surveys, profiles, cross sections, etc.?" As I see it, the only reason for the concern of the civil engineer is the first question above, and can engineers as users of topographic maps, for design purposes, depend upon the surveyor for such maps? In the end the surveyor *will* or *will not* be allowed to make such surveys; the civil engineer *will* make such surveys.

I do not see this as a controversy between the two professions; the field is so broad for the engineer that there is nothing to substantiate any accusation of what may be termed "professional jealousy." If all State registration laws for surveyors were uniform in demanding that an applicant for registration show himself qualified in the field of surveying, then this question quite likely would never have arisen.

A decision and action *either way* will not deprive the surveyor who is unqualified to do topographic surveys and other surveys of the same general nature, of anything. A decision and action *against* the surveyor doing topographic surveys and other surveys of a more technical type will deprive the qualified surveyor of work that he can well perform, desires to perform, and, more often than not, needs to perform.

The Georgia Association of Registered Land Surveyors needs to know just where its members stand on this matter. The American Congress on Surveying and Mapping needs to know and has asked to be advised of the position that its members take, as well as of the positions that the State organizations take regarding the question.

Will the surveyors over the U.S.A. awaken and be heard, or will they be content to ignore the matter until it becomes controversial, maybe in the form of a registration law?

Any man taking a course in civil engineering from International Correspondence Schools eight to ten years ago, had as his first course or

courses, "Surveying and Mapping." The Surveying and Mapping course given by I.C.S. began at the beginning and went through geodetic surveying and fundamentals of law for surveyors. The course covered numerous types of surveying, but as I recall, never defined a topographic survey, or any other as being more than a topographic, hydrographic, photogrammetric survey, etc. There was no specification that any survey was an engineering survey. The goal seemed to be to get the desired measurements (survey) correctly, and use them for whatever purpose they were needed—engineering, architecture, or whatever.

If the qualified surveyors do not speak up and make themselves heard as a body, then it is hoped that in some way those individuals of ASCE "Task Committee" assigned the task of a study and decision on what surveys are engineering surveys and what surveys are non-engineering (topographic, property, hydrographic, etc.), will find and decide in such manner as not to penalize a qualified surveyor who is not also a registered civil engineer. If the findings and decision are so difficult and controversial among those able men assigned to the task as to make a line of demarcation impossible; then it is hoped that a revision of State registration laws will eventually be made so as to require all men registered as surveyors to be able to perform any type survey, or to grant a man a license as a land surveyor, geodetic surveyor, etc.

Please consider and make your opinions known without delay!!

Very truly yours,
/s/J. Harold Smith
Secretary-Treasurer, GARLS

A.S.C.E. TASK COMMITTEE REPORT*

S. W. Dobyns**—This report was published in the March 1957 issue of *Civil Engineering* and is a valuable contribution to professional literature. However, the committeee has failed to define the terms "survey" (*n.* and *v.t.*), "surveying" (*n.*), and "surveyor" (*n.*), an understanding of which is essential to this study. In fact it is felt that a misunderstanding of these definitions has led the committee to include two categories of positions in its classification which are not surveying at all, any more than a "survey of the schools," a "survey in history," or a "survey of American literature" is surveying, namely: Category V, Aerial Survey *Services* and Category VI, Cartography (*not requiring original surveys*), both of which the Committee has had to classify as Non-engineering Surveys, by virtue of that fact.

Therefore, it is suggested that the definition of these key terms be established as the standard of the classification:

Survey (*v.t.*): To determine and delineate the form, extent, and position of, as a tract of land, by taking linear and angular measurements.

Survey (*n.*): The act or an instance of surveying; also, something surveyed. The operation of finding and delineating the contour, dimensions, and position, as of any part of the earth, on, above, or beneath its surface; also a measured plan and description of any region; reconnaissance.

Surveying (*n.*): Act or *occupation* of one who makes surveys; that branch of applied mathematics which teaches the art of making surveys.

Surveyor (*n.*): One who surveys. One who practices the art of surveying.

The committee has well defined the positions of "professional level, technician level, and preprofessional level," but it has been handicapped by the failure of the engineering profession to agree on a definition of an "engineer." I find no argument with any of the learned proposals but am inclined to reply on the accepted definition in the eyes of the public as shown in *Webster's Collegiate Dictionary:*

Engineer (*n.*): One versed in, or who follows as a calling, any branch of engineering.

Engineering (*n.*): The art and science by which the properties of matter and the sources of power in nature are made useful to man in structures, machines, and manufactured products.

Art and *science* are the all inclusive words embracing knowledge, wisdom, and the practice of a profession, which are applied to engineering and the accepted learned profession of medicine, and to surveying.

"Engineering" may modify all of the above definitions of "surveys" and their connotation is unchanged.

* Interim Report of the Task Committee on Status of Surveying and Mapping. (See Surveying and Mapping, Vol. XVII, No. 2, April–June 1957, pages 203–205, inc.)

** Member of Committee on Surveying and Mapping of the Virginia Section, A.S.C.E., and Associate Professor of Civil Engineering, Virginia Military Institute, Lexington, Va. (The letter was addressed to the Virginia Section, A.S.C.E.)

Therefore, I have no argument with the three classifications of engineering surveys recommended by the committee:

Category II—Design and Construction
Category III—Geodetic Engineering
Category IV—Cartographic Engineering

I am constrained to take issue with the classification by the Committee of Category I, Land Surveying (Cadastral) as an activity separate and distinct from engineering surveying for the following reasons:

Land Surveying is engineering surveying because it is inherent in the definition of surveying, however modified.

Land Surveying as defined in the model law is synonymous with engineering surveying.

Land surveying as defined in the statutes of the several States and Territories is synonymous with engineering surveying.

Land Surveying as a body of knowledge is more readily available in engineering schools of colleges and universities than anywhere else.

Land surveying is a function of the National Council of State Boards of Engineering Examiners.

The 1948 and 1956 reports of the Committee on Land Surveying of the NCSBEE were not formally acted on by that body, but were received as subjects which promoted wide divergence of opinions, revealed acknowledged ignorance of the basic definitions of the terms, and merited further study.

Resolution 1-52 of the National Society of Professional Engineers must be evaluated in terms of the small percentage of engineers which subscribes to that organization, albeit honorable and influential, and in light of the refusal of the Founders Societies and NCSBEE to accept their proposed Ideal Law eliminating Land Surveying from the Law.

Land Surveying as a profession is the oldest branch of the engineering profession, which is recognized as having many branches.

Finally, a point of law, which is forever the prerogative of the legislature, forever the subject of interpretation by the judiciary, and forever the guide of the executive: The definition of land surveying in the model law and the laws of the several States and Territories provides that land surveying refers to surveys for the subdivision of land, the making of plats and maps, and the preparing of descriptions of the lands so surveyed or investigated. The Task Committee states that this includes the layout of streets, according to a plan fixed by an engineer. We, as Civil Engineers, recognize that, in order that the purpose of the law might not be violated, to safeguard life, health, and property, any person subdividing land must be qualified to evaluate and employ the properties of matter and the forces of nature with reference to street grades, storm drainage, and sanitary sewerage for the subdivision to be useful to man. This is engineering.

The Virginia State Board for the Examination and Certification of Architects, Professional Engineers, and Land Surveyors has ruled that it is the opinion of the Board that, within the meaning and intent of the Code, the design of street grades and storm drainage is the practice of Civil Engineering, and that the plotting of plats together with the profiles of existing topography incidental to the subdivision of land is the practice of Land Surveying.

This ruling of the Board is at the present time the subject of a test case in the Circuit Court of Fairfax County, Virginia.

The Founder Societies have created this problem by attempting to place specific limits on the Land Surveying branch of Civil Engineering. Any such limits on any branch of engineering would raise the same problem and in the final analysis must rest on the profesisonal judgment of the individual engineers.

Now, having tied their hands in the practice of their profession, can we wash our hands of the matter and let them be crucified?

Let us accept Land Surveying as an honorable profession, a branch of Civil Engineering. Call it what you may: Land Engineer, Survey Engineer, Land Surveyor, Surveyor, or Engineer.

Therefore, I submit to you that Land Surveying is Engineering Surveying, and it is respectfully recommended that this Virginia Section, by vote, assembled, endorse this recommendation to the Board of Directors of the ASCE through the Executive Committee of the Surveying and Mapping Division of ASCE and the Task Committee of that Division.

CONTOUR INTERPOLATING SCALE

LEO A. THELEN, JR.*—I should like to contribute this material for publication in SURVEYING AND MAPPING. It may be old stuff, and if it is simply toss it out. However, I have never seen it used by anyone else. Anyway here it is:

With a slight modification the common rubber band may be used in interpolating elevations in

* Oakhurst, California.

topographical drafting where the plotted points are no more than 5 to 6 inches apart.

A rubber band ⅛ inch wide by 2 inches in length is suitable.

Stretch it lengthwise around an engineer's scale (pocket size), project the graduations onto the rubber band in India ink, and the gadget is ready for use.

Let's say we are to interpolate between points having elevations of 41 and 76 feet. Contour interval: 5 feet.

The band is looped over the tips of the index finger and the thumb, and the graduated portion is placed on line between the previously plotted points. Then, by stretching or relaxing the band and shifting it along the line, the 41 graduation and the 76 graduation are placed in coincidence with their corresponding points. The 45, 50, 55, 60, 65, 70, and 75 foot points are then marked on the map.

A few rubber bands graduated to different scales should suffice for most mapping work. When the plotted points are more than six inches apart a "reversing scissors" support might prove worthwhile.

MAPS BY ONTARIO DEPARTMENT OF MINES

J. HADDON*—I note that no reference is made to the Ontario Department of Mines as a map issuing agency under your list of Foreign Mapping Agencies. We issue a variety of mining and geological maps at many scales, according to the geological detail which we wish to portray.

The larger scale maps are usually based on ground survey supplemented by photogrammetry and are frequently the only detailed topographic maps available. The smaller scale maps are compilations from other material.

The Mineral Map of Ontario is a very recent publication of which our small staff is quite proud, in that we carried out every phase of its production from the computation of the projection to the complete fair drawing. It is the largest single sheet ever published by us, the map measuring about 50″ by 53″, and the specially made paper 53″ by 60″.

All type matter was set locally and process photography and lithography carried out by Ontario firms. You will appreciate the process problems associated with so large a map in full color.

Our maps and publications are obtainable from the Director of Publications, Ontario Department of Mines, Parliament Buildings, Toronto, Ontario, Canada.

While copies of our publications are issued without charge to those actively associated with the mining industry, there are exceptions for maps in short supply. I trust that you will find our publications of interest.

EDITOR'S NOTE—The clue to the apparent omission probably lies in the inclusion of the word "Topographic" in the title for William Hannah's contributions to the Map Information department of SURVEYING AND MAPPING. (*See* SURVEYING AND MAPPING, April–June 1956, Vol. XVI, No. 2, p. 212; October–December 1956, Vol. XVI, No. 4, p. 506; and April–June 1957, Vol. XVII, No. 2, p. 200.)

* Chief Cartographer, Ontario Department of Mines, Room 201, 67 College Street, Toronto 2, Ontario, Canada.

MORE HEADACHES

CHARLES E. GLASS*—I believe this will be of interest to our readers. It was before my time, but some of you will recall making surveys from descriptions reading thus:

"Beginning at a stone in Farmer Brown's cow pasture, distant 30.00 feet from Farmer Smith's well; running thence northerly 15 paces to land of Farmer Brown's third son, etc."

We younger fellows thought the days of these descriptions were past, but, however, I would like to draw to your attention an order my office received for a survey:

"I was recommended to you as you are a surveyor.

"Please measure the ground starting from the empty piece of land next to the saloon on 252 W. Merrick Rd., Baldwin, LI I think we have 24 ft. or 28 ft. in width and the length but I'm not sure. Also survey the land on Park View Place starting from the garages far into Park View Place.

"I would like to know how many feet we own."

I am happy to say this survey was executed.

* 2094 Fifth Street, East Meadow, L. I., N. Y.

INFORMATION PLEASE

W. B. WILLIAMS*—Frequently those of us who know Washington only from our brief visits in March have reason to wish to contact some one of the various offices of the surveying and mapping services. In some future issue of SURVEYING AND MAPPING could these services be listed and a brief resume of the functions of the office given? It would also be nice to know the names of some of the key people, particularly if they are members of ACSM.

As an example, a local firm called me last week who were trying to locate an isogonic chart of the world and I had to think quite a while before I could decide between referring them to USGS or USC&GS. I finally chose the latter and the April–June issue of the quarterly indicates that my assumption was correct. But it would be nice to be more certain when similar questions are posed.

EDITOR'S NOTE—We appreciate the possible need for this type of information by those readers who are not located in or near Washington. With the present editorial setup, there are not hours enough in the days, nor enough days in each quarter, for the editor to undertake such a compilation. However, if ACSM members in the various organizations of the Federal government, which have to do with surveying, mapping, etc., will undertake to supply us with the information, we could eventually whip the material into shape for publication.

* Vice President, ACSM, 238 Ottawa Ave., N.W., Grand Rapids 2, Mich.

POSITIVELY MISLEADING

GERALD R. HYDE*—On the enclosed sheet from the Merit Badge booklet of the Boy Scouts I have underlined a statement that they should correct. This may give someone a poor impression of surveying.

The underlined passage referred to above reads: "A surveyor does not need more than a high school education to practice his trade."

We fear that there is confusion in the mind of the writer of that passage between *surveyors* and *instrumentmen*. However, there is a lot more to surveying than just operating a transit or level and pulling a tape. Many of our present-day troubles are directly traceable to the results obtained by surveyors who had too little education. It is undoubtedly true that a good man with only a high school education could become a good *instrumentman*, but he would still be a long way from being a *surveyor*.

—EDITOR.

* 73 South River Road, Manchester, N. H.

COUNTY SURVEYOR'S FEES IN 1869

CLIFF ST. CROIX*—The following is a copy of the Fees of the County Surveyor of Santa Clara County, San Jose, California, in the year 1869, copied from an old field book of A. H. Parker, County Surveyor.

One Mile Compass & Chain	$2.00
Each succeeding mile	1.25
Compass alone	1.00
Laying out and plotting town lot	1.00
Record	0.75
Calculation	0.50
Travelling fees per mile	0.15
Copy of certificate	0.15
Erecting Monuments	1.00
Copy of plat and certificate	1.00
Expenses as agreed upon.	

* Deputy County Surveyor, Santa Clara County, Calif.

American Institute of Physics Dedicates New Building

A group of leading scientists gathered in New York October 21, 1957, to dedicate the new building of the American Institute of Physics. The building, at 335 West 45th Street, near the United Nations, is headquarters for the following societies: American Physical Society, Optical Society of America, Acoustical Society of America, Society of Rheology, and the American Association of Physics Teachers.

Prince Philip, on behalf of the Governing Board of the American Institute of Physics, conferred the first Karl Taylor Compton Gold Medal of the Institute on Dr. George Braxton Pegram, Vice President Emeritus of Columbia.

News of Related Organizations

East Bay Council on Surveying and Mapping

At its meeting on June 13, 1957, the East Bay Council on Surveying and Mapping unanimously approved the following resolutions.

ROUTE SURVEYS

Be it Resolved, That the East Bay Council on Surveying and Mapping wishes to go on record commending those public agencies who are relating their road and highway survey programs to the California Coordinate System. The establishment of permanent reference markers incidental to route surveys of all types is a valuable contribution to the public good whenever these are carefully tied to the California Coordinate System and monument data are filed with the County Surveyor's office in the county where the mark is located; since all subsequent surveys in the area may be consummated at lower cost, and enjoy the benefit of existing control as a check to avoid costly errors. The Council further wishes to urge all other agencies performing routine route surveys in Alameda or Contra Costa Counties to follow this example.

SUBDIVISIONS

Be it Resolved, That the East Bay Council on Surveying and Mapping wishes to commend:

1. Those public jurisdictions which specify by ordinance that subdivision plans be based on the California Coordinate System; and
2. Those organizations which voluntarily base their subdivisions on the California Coordinate System;

for it is recognized that this practice facilitates checking in the office of the jurisdictional agency, minimizing opportunity for error, and at the same time reduces costs for all who have occasion to use these surveys and maps in the future; and

Be it Further Resolved, That the Council wishes to urge all other agencies who have jurisdiction over subdivisions in Alameda and Contra Costa Counties to follow the example.

At its meeting of September 11, 1957, the East Bay Council on Surveying and Mapping approved the following resolution:

Resolved, That the East Bay Council on Surveying and Mapping wishes to go on record commending those public agencies who are relating their pipelines, transmission lines, and other route survey problems to the California Coordinate System. The establishment of permanent reference markers incidental to route surveys of all types is a valuable contribution to the public good whenever these are carfeully tied to the California Coordinate System and monument data is filed with the County Surveyor's office in the county where the mark is located; since all subsequent surveys in the area may be consummated at lower cost, and enjoy the benefit of existing control as a check to avoid costly errors. The Council further wishes to urge all other agencies performing routine route surveys in Alameda or Contra Costa County to follow this example.

Surveying in Florida

A new publication, *Surveying in Florida,* has appeared on the horizon. This is a publication of The Florida Society of Professional Land Surveyors, and Vol. 1, No. 1, October 1957, contained an announcement of the First Annual Convention of that Society, held at Orlando, Fla., October 10–12, 1957.

The issue also contains the following note which may be of considerable interest.

"You surveyors who are having trouble cutting through brush or seeing through citrus groves will be interested in an aluminum double tower that Ike Polk, SRD Location Engineer, Bartow, has designed. It is a double tower (for transit and operator), can easily be transported in a jeep pickup, and can be set up in heights from 5 to 30 feet. It is manufactured in Lakeland."

Kansas Society of Land Surveyors

A group of land surveyors met in the City Hall at Salina, Kans., on Saturday, September 7, 1957, for the purpose of permanently organizing the Kansas Society of Land Surveyors, with headquarters in Salina. This meeting also commemorated the 100th anniversary of the subdivision of public lands in the Kansas Territory.

Wendell C. Wyatt spoke of the preliminary work already done toward the formation of the Society. Information was gathered regarding other State organizations of this type, with help coming from the American Congress on Surveying and Mapping. Efforts were then directed toward obtaining opinions from existing Kansas engineering and architectural societies, title and abstract companies, real estate and other allied groups, as well as the opinions of various landowners. Finding such organizations to be successful in raising land surveying standards in other States and finding a demand for such an organization in Kansas, study was continued in the Salina area. In April 1957 five land surveyors met at the City Hall in Salina to discuss the formation of an organization. The following month, and in each succeeding month, meetings were held. The interest increased locally and throughout the State to such an extent that a group from another area asked for a statewide organization.

John P. Kramer discussed the matter of licensing land surveyors in Kansas and pointed out that 40 States have compulsory legislation for land surveyors. He also called attention to a study of all such laws in the United States currently being made by Victor H. Ghent, Secretary of the Property Surveys Division of the American Congress on Surveying and Mapping, for the purpose of preparing a guide for future use.

Charles N. Pfarr discussed affiliation of the Kansas Society of Land Surveyors with the Kansas Engineering Society as a functional group, pointing out that engineers and surveyors form a team which must always work together professionally as they are tied together and inseparable—yet an organization for land surveyors is definitely needed.

L. Dean Strowig amplified the remarks of Mr. Pfarr by commenting on the strides made recently by the Kansas Engineering Society in an effort to raise the land surveying standards of Kansas.

James L. Bell discussed the matter of affiliation with the American Congress on Surveying and Mapping and stressed the value of SURVEYING AND MAPPING as a sound and readable journal in the field of surveying and mapping. He stated that the membership of the American Congress on Surveying and Mapping includes land surveyors throughout the world.

There followed a discussion of the finances necessary for proper and adequate organization operation.

The Society then approved proceeding with the application for a State Charter and elected the following officers;

President, Paul H. Sweeny, Salina,
Vice President, James L. Bell, Mission,
Secretary-Treasurer, Wendell C. Wyatt, Salina.

The governing body of the Society is the Board of Directors, and the following Directors were elected, for terms as stated,

L. Dean Strowig, Salina, 3 year term,
John P. Kramer, Topeka, 2 year term, and
Grant A. Brezina, Dodge City, 1 year term.

A resolution was passed to affiliate with the American Congress on Surveying and Mapping as soon as certain standards can be met.

There were 27 land surveyors present from widely separated sections of the State, 14 being from the Salina area.

It should be noted that members of abstracting and title firms, as well as real estate and other interested groups may become Affiliate Members of the Society.

The announced purpose of the Kansas Society of Land Surveyors is to raise the Standards of Practice of land surveying in the State.

WENDELL C. WYATT
Secretary-Treasurer, KSLS

Florida Engineering Society

From the *Journal, Florida Engineering Society* for October 1957, we learn that the Florida Engineering Society now has a full-time executive director in the person of Frederick Joseph Donahue, Jr., and that the new offices of the Society were officially opened on September 16, 1957, at 114 S. E. First Street, Room 15, in Gainesville, Fla.

California Council of Civil Engineers and Land Surveyors

Surveyors had a spectacular year at the 1957 regular session of the California legislature. Signed into law were bills which:

Give surveyors lien rights for improvement work on property.

Reduce liability for cutting timber on another's land if it was done due to faulty line location by a licensed surveyor.

Changed the application fee for land surveyors license to $20.

Permit minors on survey crews to work more than eight hours per day or forty hours per week.

Permit modern reproduction methods to be used in preparing linen copies of maps for filing, and allowing the County Recorder to keep prints rather than the original, on the counter.

Prohibit use of the record-of-survey map for irrelevant purposes such as enforcement of building ordinances.

Limit to 28 days the time in which a surveyor and the county surveyor must agree on the contents of a map.

Require agencies, firms, or people to replace or properly reference monuments destroyed through their construction work.

Require State Coordinates on filed maps to be supported by sketches showing how they were derived.

Allow the Board to discipline licensed surveyors for "incompetency" rather than "gross incompetency."

Increase filing fees for maps to five dollars for the first page and two dollars for each additional page.

Appointed last year, and active in legislative matters this year has been a Surveyors Committee of the County Engineers Association, Oliver Deatsch, Stanislaus County Surveyor, Chairman. California Land Title Association advises us that it also is establishing a committee on surveying matters.

Sacramento Superior Court ruled last January that State Department of Public Works mapping contracts do not come under the licensing laws of the State. Notice has been filed that the decision will be appealed.

This is the time of year when labor contracts come up for renewal. The Council does not participate in these activities but Milton Jeanney of California Association in Los Angeles keeps up informed of them. Right now Western Association (Sacramento Valley and Santa Rosa) is negotiating with Engineers and Scientists of California Union over proposed wage increases. Bay Counties Association is negotiating with AFL-CIO Local 3 Operating Engineers. Whatever is settled between them will probably be accepted by other Local 3 employers throughout northern California. In Fresno a contract has been worked out between the San Joaquin Association and the AFL-CIO Union, American Federation of Technical Engineers. So far as we have learned the contract has not yet been signed. In Los Angeles and San Diego the California Association and the San Diego Council contract with Operating Engineers Union Local 12. A three year contract is now in force (in Los Angeles, at least) so there is no current bargaining activity. At Santa Barbara, Ventura, and San Luis Obispo the Tri-Counties Association is negotiating a new contract with a local independent union.

Curtis M. Brown, who wrote "Boundary Control and Legal Principles," will write a manual of instructions for the private practice of land surveying. The book will be sponsored by the California Council of Civil Engineers and Land Surveyors. It will be intended as a guide to practitioners, setting forth the performance standards that will be accepted by the profession.

The leaflet "How to Employ a Land Surveyor" designed by William Pafford of Los Angeles has received wide acceptance. Twenty thousand copies have been distributed within California. Several organizations in other states are adapting the idea to their needs and are issuing something similar.

The California Council of Civil Engineers and Land Surveyors will hold its annual convention January 10 and 11, 1958, at the Sheraton-Palace Hotel in San Francisco. Ninety-eight members, seventy wives and thirty-six exhibitors and guests attended the 1957 convention at Coronado, near San Diego.

Enclosed is a copy of my current newsletter. Also I am furnishing a pair of opinions furnished the Council by Bob Wilhelm, President of the Bay Counties Association of Civil Engineers and Land Surveyors.* He is a registered

* These opinions will be run early in 1958 when the new "Legal Department" will be started in the January–March 1958 issue of SURVEYING AND MAPPING.

civil engineer and a practicing attorney. The opinion on monuments differs somewhat from that held by Gurdon Wattles and published in Surveying and Mapping a few issues ago.† We asked Bob for an opinion when a County Surveyor, apparently accepting too literally the doctrines taught by Gurdon, decreed that maps tied to monuments other than at section and quarter corners would be rejected.

—WILLIAM A. WHITE
Executive Secretary, CCCE&LS

† *See* SURVEYING AND MAPPING, Vol. XVII, No. 1, January–March 1958, pages 42–48, inc.

Georgia Association of Registered Land Surveyors

From *Field Notes,* published by the Georgia Association of Registered Land Surveyors, we find the following items of interest in the October 1957 issue.

The GARLS summer outing, in the form of a family-style picnic, evidently proved to be quite a success. Two types of European instruments were demonstrated and two teams of chairmen staged demonstrations of chaining. One team used slope-distance measurements while the other used the time-honored step-chaining method. The report seems to leave one in doubt as to whether this was a contest or not, and, if it was a contest, no mention of the winning team is made.

This organization now has its headquarters in the Architects and Engineers Institute building, at 230 Spring St., N.W., Atlanta, Ga. GARLS is a member-organization of that Institute.

The Institute celebrated its first anniversary during the week of October 14–19 by holding an open house in its new four-story home in the heart of Atlanta.

The feature of this October issue of *Field Notes* is a brief article on "The Tellurometer" by Prof. J. O. Eichler.

At the meeting held September 7, 1957, the GARLS approved a motion "that a committee be appointed to set out the duties of a Surveyor and that this list of duties be forwarded to the American Congress on Surveying and Mapping, the American Society of Civil Engineers, and the State Board of Registration for Engineers and Land Surveyors."

Indiana Society of Professional Land Surveyors

We learn from *Surveying and Mapping Newsletter,* October 1957, that the fall meeting of the I.S.P.L.S. committees was held in Canyon Inn at McCormick's Creek State Park during the afternoon and evening of October 4, 1957. Over twenty members were present, many accompanied by their wives, and nearly all committees were in action.

The Sixth Annual Meeting of the I.S.P.L.S. will be held on Friday and Saturday, January 17–18, 1958, at Lafayette, Ind.

Washington Bureau of Surveys and Maps

The Bureau of Surveys and Maps of the State of Washington is a new organization, only about two years old. Until March 1957, the Bureau was a branch of the State Department of Public Lands, but at that time the Departments of Public Lands and Forestry were merged to form the Department of Natural Resources, and the Bureau of Surveys and Maps is now a part of the new department. The mailing address is Box 110, Olympia, Wash.

The Bureau produces a "Bulletin" and other publications such as the "Periodical List." The Bureau will attempt to summarize important articles in foreign publications on matters dealing with new developments in the field of surveying and mapping and to publish these summaries in the "Bulletin."

So far as is known at present Maryland and Washington are the only two States to have organized such bureaus.

ACSM member Burton R. Ingalls is Chief of the Washington Bureau of Surveys and Maps.

CONGRESS NEWS

Election of Officers for 1958

Under provisions of ACSM Constitution and Bylaws, the following ACSM Nominating Committee was appointed by President Lyddan: Helmuth Bay, Roland H. Moore, and I. E. Rittenburg, Chairman, with Walter S. Dix ex officio secretary to the committee. The committee met on October 3, 1957, and does hereby present and introduce the following candidates accepting nomination and responsibility of office if elected by ballot of the membership for the coming year.

For President (one year term)
WILLFRED B. WILLIAMS, Grand Rapids, Mich.

For Vice President (one year term)
GEORGE C. BESTOR, Carmel, Calif.

For Directors, 1958–59 (Five to be elected for two-year terms)
RALPH MOORE BERRY, Ann Arbor, Mich.
DUNCAN M. FITCHET, Chicago, Ill.
VICTOR H. GHENT, Annandale, Va.
EVERETT D. MORSE, Houston, Texas
JESSE E. MUNDINE, Arvada, Colo.

Ballots are scheduled to be mailed to the membership during the final quarter of 1957 so that election results can be announced as early as possible in the new year. Actual induction of officers will take place during the 18th Annual Meeting in March 1958, the incumbent officers remaining in office until that time.

Brief biographies of the candidates follow:

WILLFRED B. WILLIAMS

Mr. Williams was born in Grand Rapids, Mich., and has lived in that city throughout his entire life. He graduated (B.S.) from Michigan State College in 1921; received the C.E. degree from the same school in 1931; holds registration in Michigan both as a land surveyor and as a civil engineer; has been County Surveyor of Kent County since 1939, when he succeeded his father who had held the same office since 1892; and is now Vice President of ACSM.

In 1924 the father and son and two others incorporated their private practice under the name of Williams and Works. They have been active in all phases of land surveying, mapping, property development, sanitary engineering, and highway engineering since that date, primarily in western Michigan. W. B. Williams has been president of the organization since 1931. His son, Ted, (R.L.S. and P.E.) is also an officer, and his grandson shows inclinations to follow the same trail.

"Bill" is Vice President of the Michigan Title Company, a Past President of the Michigan Society of Registered Land Surveyors, a Director of the Michigan Engineering Society, and has been a member of ACSM since 1949. He is a member of the ACSM Advisory Committee and preceded Gordon Ainsworth as Chairman of the Property Surveys Division.

GEORGE C. BESTOR

George C. Bestor was born July 10, 1902, in Minneapolis, Minn., and received his education there. His first surveying experience was during the construction of the Alaska R.R. He returned to the University of Minnesota and received a B.S. in Civil Engineering in 1924.

Following graduation he spent some time in the oil industry. This included three years in Australia, during which period he personally started the first American-type filling stations in that country. He returned to the United States and during depression years operated what is probably rock-bottom for an engineer—a wholesale dress business.

Five years of Civilian Conservation Corps duty with the Army was followed by five years of wartime service, half of the latter again in Alaska.

He entered private engineering and surveying practice at Carmel, Calif., in 1946, and has maintained offices there since that time. These operations include subdivision work, land planning, and general engineering and surveying.

He is currently Vice President of the California Council of Civil Engineers and Land Surveyors. Other associations: American Society of Civil Engineers and Urban Land Institute.

RALPH MOORE BERRY

Ralph Moore Berry, a graduate in civil engineering from the Catholic University of America, served for many years as chief of the Operations Branch of the Division of Photogrammetry of the Coast and Geodetic Survey until he left the Survey to become Professor of Geodesy and Surveying at the University of Michigan, Ann Arbor, Mich. In 1954 Moore received the Department of Commerce Meritorious Service Award. For a year or two prior to his leaving the Survey he had been an assistant to the Director and on special assignment to the Office of the Assistant on Cartography, U. S. Bureau of the Budget.

Professor Berry is a registered professional engineer and land surveyor in Maryland and Michigan.

A charter memeber of ACSM, he served for ten years on the Annual Meeting Committee; was chairman of the Property Surveys Division from 1951 to 1953; and was granted an Honorary Citation by the Congress in 1951.

Professor Berry is a member of the American Society of Civil Engineers, American Society of Photogrammetry, Michigan Society of Registered Land Surveyors, American Association for Engineering Education, Phi Kappa Phi, and a past president of the Prince Georges-Montgomery Engineers Society (of Maryland).

DUNCAN MACLELLAN FITCHET

Duncan Fitchet was born in Boston, Mass., February 2, 1925, and received his early schooling in Newton. Earning his A.B. degree from Dartmouth College, Hanover, N. H., he furthered his studies at the University of Chicago —Executive Program, M.B.A. During the years 1943–1946 and 1951–1952, he served with the U. S. Marine Corps.

An active member of ACSM's Cartographic Division and a member of the Board of Direction of that Division, he is also the American representative on a six-member international committee investigating the prospects of forming an International Cartographic Organization. This committee activity grew from the Esselte conference on cartography in Stockholm in 1956.

He belongs to several professional and social organizations in Chicago and is a member of Sigma Nu fraternity. Mr. Fitchet is the General Manager of the Creative Division of Rand McNally & Company of Chicago. He resides in nearby Wilmette, Ill.

VICTOR H. GHENT

Victor H. Ghent of Annandale, Va., is a Professional Engineer and Land Surveyor practicing in general land surveying, land planning, and engineering.

He received his education from Baltimore Polytechnical Institute, Johns Hopkins University, and I.C.S. He was a United States Army instructor, 1943–1956. Offices which he has held in the recent past include: Secretary-Treasurer, Virginia Association of Surveyors (3 years); Charter President, Northern Virginia Chapter, V.A.S.; President Annandale Businessmens Association; Cabinet Secretary-Treasurer Lions District 24 C; Secretary-Treasurer and President Annandale Lions; and Corresponding Secretary, Property Surveys Division, ACSM. He is a charter member of the Virginia Society of Professional Engineers, a member of the American Society of Photogrammetry, and a member of Alpha Chi Rho fraternity.

He is currently serving as director N.V.C., V.A.S.; his third year as Secretary-Treasurer, Property Surveys Division, ACSM; and is on the Executive Committee of ACSM.

EVERETT D. MORSE

Everett D. Morse was born in Beaumont, Texas, July 29, 1905. He attended Texas Agricultural and Mechanical College, 1924–1927, majoring in civil engineering, and began employment with the Houston Lighting and Power Company as a draftsman and surveyor. He was placed in charge of the Map Records Division of the Company in 1929 and served on that assignment until 1942. During this period a new system of large-scale coordinated planimetric maps, based on control surveys, was planned and accomplished under his direction. This included, among several other areas, some 400 square miles of urban Houston which were controlled by an integrated system of triangulation and traverse.

Mr. Morse served as a photo-intelligence officer with the 13th Air Force in the South Pacific from 1942 until injuries incurred at Guadalcanal required his retirement in 1944. He resumed employment with the Houston Lighting and Power Company in 1944 as Civil Engineer and, subsequently, as Superintendent of Civil Engineering—which assignment has continued until the present.

He holds registration in Texas as a Professional Engineer, a Licensed State Land Surveyor, and Public Surveyor.

His affiliations include the American Society of Civil Engineers, Texas Society of Professional Engineers, Texas Surveyors Association, American Society of Photogrammetry, and Society of American Military Engineers.

He served as Chairman of the Texas Section, ACSM, in 1953; as President of the Texas Surveyors Association in 1954; and as Chairman, Control Surveys Division, ACSM, in 1956.

JESSE E. MUNDINE

J. E. Mundine, known familiarly as "Jesse" or "Ed," worked for private engineering firms during 1933–1935 and then briefly with the U. S. Geological Survey in 1936. In 1936 and 1937 he returned to school—University of Arizona and the Curtis Wright Technical Institute. From 1937 through 1938 he was with the Experimental Department at Douglas Aircraft Company. He then rejoined the U. S. Geological Survey and is presently Chief of Field Surveys, Rocky Mountain Region.

In 1954 he was instrumental in organizing the Colorado Section of ACSM in the Denver region, becoming its first Chairman. Under his leadership, the new Colorado Section cosponsored the 1956 Regional Meeting of ACSM and ASP in Denver in cooperation with the Rocky Mountain Section of the American Society of Photogrammetry.

He has contributed as a speaker to ACSM Annual Meetings and as a writer to ACSM's Journal SURVEYING AND MAPPING. Well known in the East and West as well as in Alaska, he now resides in Arvada, Colo.

President Lyddan has appointed the following Committee of Tellers to tabulate the results of the election of officers for the American Congress on Surveying and Mapping for 1958:

William B. Sears
Julius L. Speert
Abert C. Kalbfleisch, Chairman.

Southern California Section

The Third Annual Drafting Clinic, an event designed particularly for mapmakers, was held on March 8, 1957, in the General Petroleum Auditorium in Los Angeles. This event, jointly presented each year by the Southern California Sections of ACSM and the American Society of Photogrammetry, was an outstanding success this year with more than 200 in attendance. Exhibitors included the U. S. Coast and Geodetic Survey, U. S. Geological Survey, U. S. Corps of Engineers, Los Angeles County Engineers, Title Insurance and Trust Co., Fairchild Aerial Surveys, Rapid Blue Print Co., and such nationwide drafting equipment firms as Bruning, Dietzgen, Keuffel & Esser, Los Angeles Scientific, and Technifax.

A primary activity of the Section this year has been the promotion of educational opportunities for surveyors and mapmakers in Southern California schools and colleges. Classes have been organized in Los Angeles, Ventura, and Orange Counties covering geodetic surveying, land title and description, and elementary and advanced surveying. It is expected that a course on the California State coordinate system will be organized at UCLA by the start of the next semester.

The California State Legislature is at present considering Assembly Bill No. 624 which amends that portion of the Business and Professions Code applying to surveyors. Because

A. C. JOHNSON (*left*), PROGRAM CHAIRMAN, WITH W. C. WATTLES (*center*), AND FRIEND AT LOS ANGELES COUNTY EXHIBIT AT DRAFTING CLINIC

supposed joint agreements with the Northern California Section and the California Council of Civil Engineers and Land Surveyors concerning amendments to the bill failed to materialize as expected, the Section is actively opposing the bill as it now stands. It is believed that the bill will be killed. In this event, the Section's Legislation Committee, headed by W. C. Wattles, will offer a substitute bill.

—SELWYN DOUGLAS
Section Chairman

Northern California Section

A dinner meeting of the Northern California Section, ACSM, was held at the Big 4 Inn, Arcata, Calif., on Friday, September 27, 1957. Dinner was served at 7:00 p.m., and the formal program, arranged by program chairman Charles H. Shaller, followed the dinner.

The general topic for discussion was the California System of Coordinates. C. J. Aggeler, Instructor in Engineering, City College, San Francisco, discussed the theory of the California Coordinate System, and W. A. Angeloni, U. S. Army Engineer District, Corps of Engineers, San Francisco, spoke on the use of the California Coordinate System in connection with harbor-line monuments for Humbolt Harbor.

Mr. Aggeler, Chairman, Education Committee, has arranged for two courses to be given at the Sequoia Union High School in Redwood City—X1A, Plane Surveying and 805AB, Control Surveys and the California Coordinate System.

Another course, the theory and lecture equivalent of a first semester college course in plane surveying, is to be given at Santa Rosa Junior College.

Similar courses are being given by the University Extension in San Francisco and Berkeley.

The Annual Meeting and the 4th Annual Surveyors Workshop, was held at the Casa Munras Motel, at Monterey, November 2, 1957.

Cartography and Topography Divisions Hold Combined Meeting

The Cartography and Topography Divisions of ACSM staged a good meeting on November 6, 1957, in the Interior Auditorium in Washington, D. C. The principal feature was a panel discussion of the career opportunities in the field of surveying and mapping. The panel was composed of C. Mansel Keene, Civil Service Commission; Shirley Griffith, Bureau of the Budget; Duncan Fitchet, Rand McNally & Company; and A. O. Quinn, Aero Service Corporation. R. H. Randall, Jr., served as moderator. The chosen topic, "How to make a living making maps," was discussed at length by the panel members. There followed a question and answer period.

To complete the program, Captain E. A. McDonald, U. S. Navy, showed a number of colored pictures taken by him recently while aboard an ice breaker engaged in Antarctic exploration.

ACSM's New Centrally Located Office

ACSM has opened a new office in Rooms 905–906 in the Washington Building located at the intersection of New York and Pennsylvania Avenues at 15th Street, N.W., in Washington, D.C. The telephone number is DIstrict 7-0029. Visitors to Washington are cordially invited to drop in and discuss their membership and other ACSM problems.

For the present, ACSM treasury and membership operational details will be managed from the Central Office, with Treasurer H. W. Hemple on duty Tuesdays and Fridays, Chairman F. S. Borden on duty Mondays and Thursdays, and our former treasurer R. T. Evans, who is Chairman for Library Members and Subscriptions, on duty Wednesdays. Each will carry on some operations in their respective home offices as usual. In this respect, Editor Rappleye will continue to operate entirely from his home office at 6712 Fourth St., N.W., Washington 12, D. C., and Executive Secretary Dix will operate from his regular place of business at Room 435 Woodward Building, 733 15th St., N.W., Washington 5, D. C., which is about one block away from the ACSM office location. The official address of ACSM will remain as P. O. Box 470, Benjamin Franklin Station, Washington 4, D. C.

As the central reference files are built up, it is the objective hope that a considerable amount of routine work load can be shifted from the overburdened executive secretariat. This activation follows two years of committee study and Board approvals authorizing funds budgeted for token salaries or honorariums, rent, furniture, and operational expenses. The expansion was necessitated by the natural growth of ACSM over the years.

Property Surveys Division Activates Three Important Committees

As of July 10, 1957, Chairman A. Phillips Bill of the Property Surveys Division of the American Congress on Surveying and Mapping made appointments or continued previous appointments by former Chairman Gordon E. Ainsworth, as follows:

Committee to study and propose a **Model Registration Law for the Land Surveying Profession:**

Curtis M. Brown, *Chairman,* 2802 Juan St., San Diego 10, Calif.

A. Phillips Bill, 289 Main St., South Deerfield, Mass.

V. H. Ghent, Box 937, Route 1, Annandale, Va.

Ralph Kelsey, 686 East 120th St., Cleveland 8, Ohio.

Arnold Lundgren, 1234 Fourth Ave., Rockford, Ill.

John T. McMahon, 13205 Charlevoix Ave., Detroit 15, Mich.

Prof. Paul P. Rice, Rutgers University, New Brunswick, N. J.

R. L. Sargent, M&M Bldg., Houston 2, Texas.

William C. Wattles, 1653 Santa Barbara Ave., Glendale 8, Calif.

Committee to study and review the **"Equitable Fees" Report** adopted by ACSM in 1949:

James L. Bell, *Chairman,* Box 224, Mission, Kans.

Newell B. Snow, 207 Main St., Buzzards Bay, Mass.

A. Phillips Bill, 289 Main St., South Deerfield, Mass.

V. H. Ghent, Box 937, Route 1, Annandale, Va.

Dudley C. Howard, P. O. Box 900, Dallas, Texas.

Prof. Paul P. Rice, Rutgers University, New Brunswick, N. J.

C. A. Wooldridge, Jr., P. O. Box 1012, Carmel, Calif.

Committee to investigate, study, and propose a **Standard of Ethics for the Land Surveying Profession:**

Sol A. Bauer, *Chairman,* 411 Union Bldg., 1836 Euclid Ave., Cleveland 15, Ohio.

A. Phillips Bill, 289 Main St., South Deerfield, Mass.

Ralph P. Black, 858 Oakdale Rd., N.E., Atlanta, Ga.

V. H. Ghent, Box 937, Route 1, Annandale, Va.

Dudley C. Howard, P. O. Box 900, Dallas, Texas.

Llewellyn T. Schofield, 49 Park St., Framingham, Mass.

William C. Wattles, 1635 Santa Barbara Ave., Glendale 8, Calif.

"Fees" and "Standards" Reprints Available

Chairman A. Phillips Bill of the Property Surveys Division, ACSM, and the Executive Committee, ACSM, have approved a second reprinting of:

"Equitable Fees for Property Surveys" from SURVEYING AND MAPPING, Vol. IX, No. 3, July–September 1949, pages 165–167, and

"Technical Standards for Property Surveys" from SURVEYING AND MAPPING, Vol. VI, No. 3, July–September 1946, pages 210–213.

Copies may be obtained on request. Write to ACSM Central Office, 905 Washington Bldg., Washington 5, D. C.

Obituary

The ACSM is saddened to learn of the passing of **H. F. (Pete) Peterson,** Chairman of the Southern California Section of ACSM in 1952 and an active and enthusiastic supporter of the Section and its activities throughout the period of his membership. During Mr. Peterson's term as Chairman and later as a Director, he had an important hand in revivifying the Section through the establishment of regularly scheduled surveying and mapping field days, the launching of a monthly Section bulletin, and successful drives for increased membership.

Past President FitzGerald Retires

Gerald FitzGerald, Chief Topographic Engineer, U. S. Geological Survey, retired from the Federal service on September 30, 1957.

Mr. FitzGerald became the head of the Topographic Division in 1947, at a time when its strength had been seriously depleted by the war effort. It was necessary to remodel aims, functions, and methods of attacking the Survey's mapping activities along modern lines. For his accomplishments along these lines he has been given high praise and worldwide recognition.

Prior to World War II, the Topographic Division produced about 100 maps annually—today's output is approximately 1,800 per year. An important element in this progress has been the work of designing and developing new mapping techniques under the direction of Mr. FitzGerald.

He is a native of Burns, Oreg.; was born January 22, 1898, was educated in public and private schools in Oregon and Washington; and joined the staff of the Geological Survey in 1917. Except for brief intermissions to continue his studies in engineering, he served continuously until 1942 on a wide variety of surveying and mapping assignments in the United States, Alaska, and the West Indies.

While working with the Survey, Mr. FitzGerald became a specialist on reconnaissance mapping and, in 1938, was placed in charge of topographic surveys in Alaska. In this capacity he organized and assisted in the original development of "trimetrogon mapping," a cooperative Geological Survey–Army Air Force program to provide worldwide map coverage for military operations. In recognition of this work he received the 1944 Award of the American Society of Photogrammetry for "outstanding achievement in photogrammetry."

In 1942 Mr. FitzGerald was commissioned in the Air Corps and assigned to the Aeronautical Chart Service. He commanded this organization, with the rank of colonel, from 1943 until relieved from active duty in 1946. For this work he received the Legion of Merit. He returned to the Geological Survey as Staff Topographic Engineer. His appointment as Chief Topographic Engineer took place on May 22, 1947.

Col. FitzGerald is a past president of both the American Society of Photogrammetry and the American Congress on Surveying and Mapping, a member of the Canadian Institute of Surveying, the American Geophysical Union, the Washington Society of Engineers, the Cosmos Club, and the Explorers Club.

On May 26, 1949, he was awarded the Department of the Interior's gold medal "for distinguished service."

GERALD FITZGERALD

Whitmore Appointed Chief Topographic Engineer

The appointment of George D. Whitmore, as Chief Topographic Engineer, U. S. Geological Survey, was announced September 30, 1957. He succeeds Col. Gerald FitzGerald who retired on that date.

A native of Hillman, Mich., Mr. Whitmore began his long career in surveying and mapping as a rodman on a topographic survey for the city of Jackson. Later he was associated with R. H. Randall and Co., Inc. For twelve years, beginning in 1933, he was Chief of Surveys, Tennessee Valley Authority. In 1945 he transferred to the Geological Survey as Chief of the Technical Staff of the Topographic Division and became Deputy Chief Topographic Engineer in 1956.

Mr. Whitmore is widely known in surveying-and-mapping circles for his writings and for his activities in professional societies. He is the

author of *Advanced Surveying and Mapping*, as well as shorter the texts *Geodetic Surveying, Elements of Photogrammetry*, and *City Surveying*. He is coauthor of *Manual* 10, *City Surveys* published by the American Society of Civil Engineers. He is also associate editor for surveying for the new *American Civil Engineering Practice* published by John Wiley & Sons.

He is a member of the American Society of Civil Engineers; in 1949 was chairman of the Surveying and Mapping Division of that society; is currently chairman of the City Surveys Committee; and for several years has been chairman of the Mapping Committee of the National Capital Section of ASCE. He was president of the American Society of Photogrammetry in 1952 and became an honorary member in 1954. He is a member of the Society of American Military Engineers, the American Geophysical Union, the Cosmos Club, and is a two-term past president of the American Congress on Surveying and Mapping. He is also chairman of the International Committee on Topography and Photogrammetry, Commission on Cartography, Pan American Institute of Geography and History.

In 1956 he represented the Interior Department and Geological Survey at the International Society of Photogrammetry meeting in Stockholm, Sweden. For the past two years he has served on a three-man Special Task Committee of the American Society of Civil Engineers, to make a study of the status of surveying and mapping in the over-all field of engineering.

Mr. Whitmore was married in 1918 to the former Helen Hern O'Neill of Jackson, Mich. They reside at 6806 Florida Street, Chevy Chase, Md.

GEORGE D. WHITMORE

Personals

Dr. **Michael V. Smirnoff,** formerly Lecturer in Engineering at the University of California in Los Angeles, has accepted an appointment as Associate Professor of Civil Engineerng at North Carolina State College of Agriculture and Engineering, Raleigh, N. C.

Ernest J. Parkin transferred from his position in the Geodesy Division, Coast and Geodetic Survey, on July 26, 1957, to a position as Geodetic Advisor, U. S. Air Force, Orlando, Florida.

Dr. **Max J. Gleissner** has recently been appointed to the position of Chief Engineer and Assistant Manager for Falcon Air Maps Co., Denver, Colo. Dr. Gleissner recently retired voluntarily as Chief, Field Surveys, U. S. Geological Survey, after 39 years of service.

William H. Cook, a member of the faculty of Loyola University of Los Angeles, has been appointed to the Scientific Advisory Board, of Hycon Aerial Surveys, Inc.

Samuel Sachs, formerly Chief of Research, Reproduction Branch, Coast and Geodetic Survey, has resigned from the Federal service to take an active part in the management of Direct Reproduction Corporation, 811 Union Street, Brooklyn, N. Y.

Jon S. Beazley, formerly Photogrammetric Engineer, Traffic and Planning Division, has been appointed Engineer of Photogrammetry, Photogrammetric Division, State Roads Department (Florida).

Charles Pierce has been appointed Assistant Director, Coast and Geodetic Survey, with the rank of Rear Admiral. Admiral Pierce graduated from Tufts College in 1922 and entered on duty with the Coast and Geodetic Survey the following year. Prior to this appointment, Admiral Pierce served as Chief of the Geodesy Division.

CHARLES PIERCE

Rader and Associates, Miami, Fla., recently obtained a stereocartograph machine, one of five such machines now operating in the United States. ACSM members **Earle M. Rader** and **C. C. Crump** are listed as members of this organization.

Floyd W. Hough, formerly Chief of the Geodetic Division of the Army Map Service, retired on January 31, 1957. **David L. Mills** has been named to succeed Colonel Hough as Chief of the Division. Frank L. Culley, formerly with the Division of Geodesy, Coast and Geodetic Survey, has been named Assistant Chief of the Geodetic Division at the Army Map Service.

Rear Admiral **Robert W. Knox,** Retired, Coast and Geodetic Survey, has been elected for a five-year term as President of the International Hydrographic Bureau Directing Committee with headquarters in Monaco. His retirement from the Coast and Geodetic Survey, which was effective July 1, 1957, terminated 34 years of service, 20 years of which were spent at sea in surveys along the Pacific coast of the United States and Alaska and in the Hawaiian Islands.

Captain **Walter H. Bainbridge** retired September 30, 1957, after 34 years service with the Coast and Geodetic Survey.

Charles A. Whitten, of the Division of Geodesy, Coast and Geodetic Survey, and Chairman, Publications Committee, ACSM, has been elected Vice President, Association of Geodesy, International Union of Geodesy and Geophysics.

Colonel **Richard W. Philbrick** is now Commander, Iceland Air Defense Force.

Henry E. Simmons retired from the Topographic Division, Geological Survey, October 31, 1957, after almost 42 years of government service including 15 months of military service during World War I. After graduation from the University of Minnesota, he began his career as a topographic engineer in the field, and his assignments included work on the Chicago and Vicinity and Superior National Forest maps. He was detailed to the Arlington office in 1943 to help organize the Survey-AMS cooperative foreign mapping program. When this program was completed, Mr. Simmons was selected to fill the newly established position of Chief, Plans and Production Section, Atlantic Region, where he served until his retirement.

ASP Semiannual Convention

The Semiannual Convention and Trade Exhibit of the American Society of Photogrammetery was held at the Hotel Chase, St. Louis, Mo., October 2–4, 1957. An imposing array of papers was presented, covering subjects ranging from "Tracking the Earth Satellite and Its Significance to Photogrammetry" to "Inventory of Large Coal Piles."

NEW MEMBERS

INDIVIDUAL MEMBERSHIPS

ASHCRAFT, Archie N., DAC, Army Map Service, Far East, c/o Army Attache, Box "B," APO 74, San Francisco, Calif.—Cartographic and Geodetic Engineer

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BENNETT, W. B., P.O. Box 464, Bessemer, Ala.—Engineer and Land Surveyor

BLOMQUIST, Paul E., 200 Front St., Deposit, N. Y. —Senior Section Engr., Board of Water Supply, City of New York

BONNER, Gerald W., U. S. Geological Survey, Box 133, Rolla, Mo.—Cartographer

BOTHWELL, Robert W., P.O. Box 1492, El Paso, Tex.—Senior Engineer, El Paso Natural Gas Company

BOUCHER, Lawrence D., 2551 Washington St., San Francisco, Calif.—Keuffel and Esser Co.

BRINKS, Oscar H., 228 North Sixth St., Quincy, Ill.—Partner and Manager, Arteraft Co.

BROWN, Prof. William J., 3 Pierrepont Ave., Middlesex, N. J.—Asst. Professor of General Engineering, Rutgers University

BUNKER, Gordon, Room 8, 27 North Main St., Concord, N. H.—Surveyor for E. N. Roberts, Engineer

CARLSON, Robert P., 3706 Larson Ave., Rockford, Ill.—Surveyor with Arnold Lundgren and Associates

CASSADY, E. Patrick, P.O. Box 301, Mississippi City, Miss.—Land Surveyor

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COLE, Floyd N., Jr., 806 Ammons Dr., South Houston, Tex.—Party Chief and Field Engineer, Sharpstown Development Corp.

COULSON, Richard H., 16251 Bermuda St., Granada Hills, Calif.—Estimator, Voorheis-Trindle Co.

CRONE, D. E., 4416 Brunswick Ave., Los Angeles, Calif.—Land Draftsman, Amerada Petroleum Corp.

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ESTES, William H., P.O. Box 461, Twentynine Palms, Calif.—Public Works Office, U. S. Marine Corps

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GIBSON, James, 610 Dexter St., Santa Rosa, Calif. —Civil Engineering Associate, City of Santa Rosa

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MULDERS, Henk C/A Shell de Venequela, Dept. de Marina, Maracaibo, Venezuela—Hydrographic Surveyor

NEELY, Gene, 1423½ Mohawk St., Los Angeles, Calif. —Topographic and Land Draftsman

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POTASH, Sam R., 133 Dobson St., Evanston, Ill.—Highway Engineer, Cook County Highway Department

PREYSS, Carl R., c/o Ertel-Werkfuer Feinmechanik, Prinzenstrasse 28, Munchen 19, Germany—Manufacturers of Geodetic Instruments

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Underwater Survey by Underwater Television Camera

Recently a test demonstration was staged for engineers of the Tennessee Valley Authority at Wheeler Dam at Sheffield, Alabama. Using the Bloodworth Marine Company's Underwater Closed Circuit Television underwater camera equipment, in depths of 20, 60, and 100 feet, an examination of the spillway underwater construction and apron was successfully performed.

Special lighting for the underwater camera unit made it possible to view underwater conditions even in darkness. Not only was the face of the dam visible on the monitor screen on the surface vessel, but effects of erosion and cracks were magnified two to three times normal size and were clearly visible. Individual pebbles in the concrete aggregate were discernible.

Such examinations previously were made by "hard helmet" divers. Visibility, even with face masks pressed against the concrete walls, was so poor that much reliance had to be placed on the interpretation of feel-and-touch findings relayed to those above.

The new underwater camera unit weighs about four pounds submerged and can be operated at depths as great as 180 feet. The diver need only direct the camera under instructions from above, as all electronic adjustments are made at the camera control unit on the surface vessel or at a land station.

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Gosport Dedicates 10 O'clock Line Historical Monument

The following interesting item is reprinted from the October 1957 issue of *Surveying and Mapping News-Letter*, published by the Indiana Society of Professional Land Surveyors and edited by ACSM member Professor Kenneth S. Curtis of Purdue University.

—EDITOR

A historical monument, marking the site of the historic 10 O'clock Line Treaty of 1809, has been dedicated at Gosport, Indiana. The line marked the northern limit of a tract of land purchased from the Indians, primarily from the Miami tribe. The 10 O'clock Line stretched from a point southwest of Seymour, northwestward to near Clinton in Vermillion County. The area to the south of this line, bounded approximately by the Ohio and Wabash Rivers, was later to become the State of Indiana. The Indians were suspicious of the white man's surveying equipment and insisted that the line follow the shadow of a spear stuck in the ground as cast by the 10 o'clock sun. The monument, a 14-ton block of Indiana limestone, depicts General William Henry Harrison and Indian Chief Little Turtle agreeing on the boundary, with other Indian chiefs and white men huddled around them. It is set in a triangular one-acre picnic and rest park, on the west side of Indiana Highway 67 at Gosport. The Indiana Historical Society participated in the dedication. The I.S.P.L.S. has under consideration the placing of similar monuments at Freeman's corner and at the initial point of the 2nd Principal Meridian. Even though the I.S.P.L.S. did not participate in the 10 O'clock Line monument, it certainly has an interest in it.

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UET Buy Site for New Headquarters

United Engineering Trustees, Inc., owner and operator of the property at 29 West 39th Street, New York City, has long felt the need of larger quarters. The purchase of a site for a new headquarters building was announced this past summer. The site is on the west side of First Avenue, opposite the United Nations headquarters, and extends the entire block from 47th Street to 48th Street.

At one time, consideration was being given to moving the headquarters of UET to some other city. The purchase of the site in New York would seem to indicate that the proposed move to another city has been abandoned.

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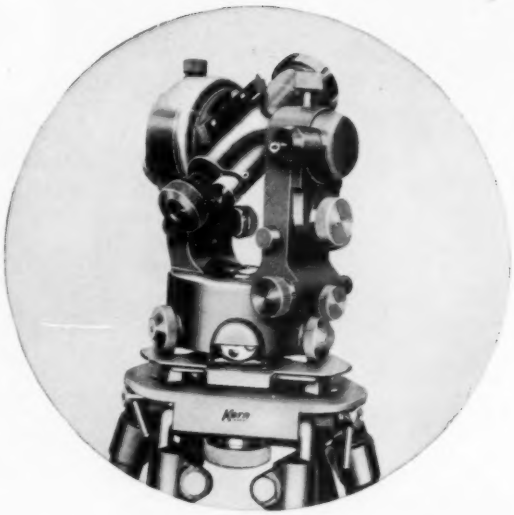

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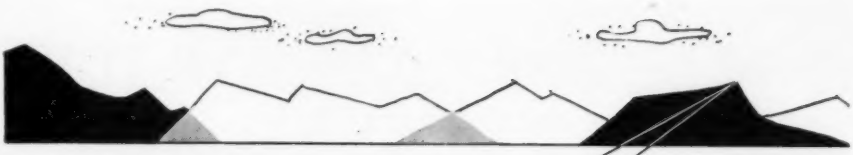

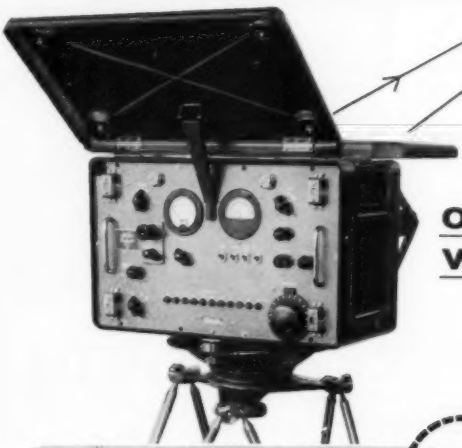

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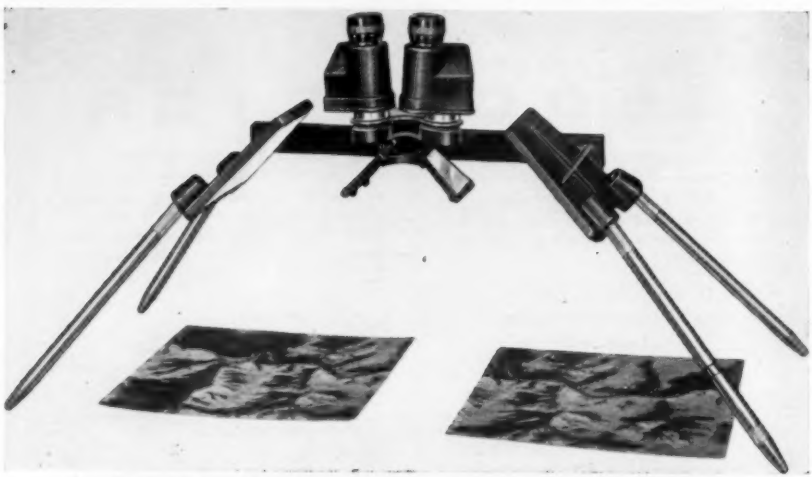

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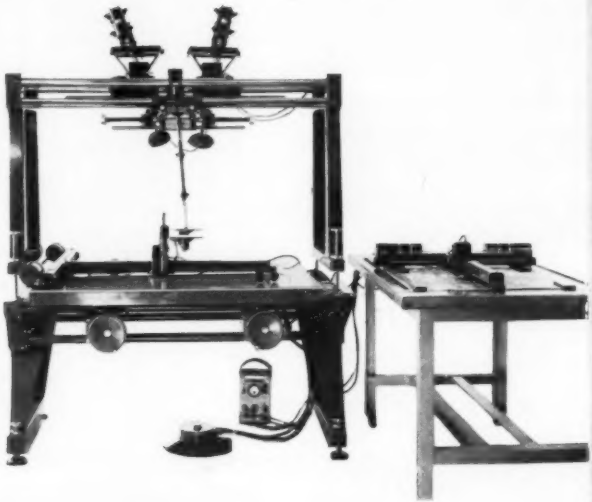

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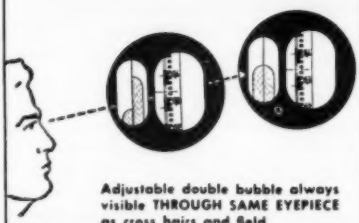

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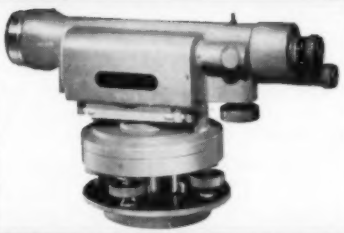

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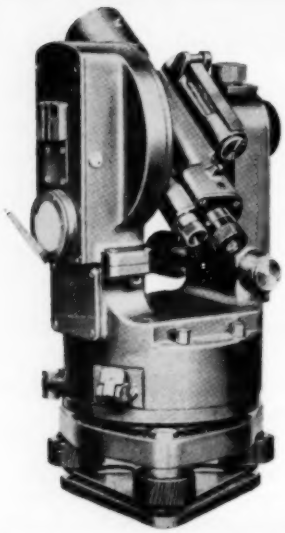

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TELLUROMETER TESTS SUCCESSFUL IN FOGBOUND ALEUTIANS

A release by the Coast and Geodetic Survey, under date of October 6, 1957, states that a field project, which normally could have taken four months to complete, was finished in 14 working days with the use of the Tellurometer. Although this new equipment was developed by scientists of the Union of South Africa, it has been found to be particularly adapted to conditions, on the opposite of the globe, in the Aleutian Islands which are for so much of the time shrouded in fog or semidarkness.

NATIONAL ACADEMY OF SCIENCES NATIONAL RESEARCH COUNCIL

President Detlev W. Bronk, of the National Academy of Sciences—National Research Council, has announced the appointment of Dr. Guy Waddington as Director of the Office of Critical Tables in the Division of Chemistry and Chemical Technology. He assumed the duties of the office on October 7, 1957. This information will be of great interest to many chemists, physicists, and engineers who have expressed concern over the obsolescence of the International Critical Tables.

HYDROGRAPHIC SURVEY RECORDER

A news release from Bludworth Marine calls attention to their new Model ES-130 depth recorder which weighs less than 40 pounds and is claimed to be capable of recording depths from 2 to 245 feet with an accuracy of 0.5 per cent, neglecting variations from the propagation velocity of 4,800 feet per second for which the equipment is designed.

NEW TYPE OF PLANIMETER

A new type of planimeter, which sets back to zero at the touch of a button, has been announced by the Fennel Instrument Corporation of America. The new instrument is of the optical compensating type and has an optical tracing lens instead of the usual point.

PENCILS ARE BIG BUSINESS

The Eberhard Faber Pencil Company, which claims to be America's oldest writing equipment manufacturer, has recently moved to a new location at Crestwood, Wilkes-Barre, Pa. After 108 years in and around New York City, this company has left its 21-building operation in Brooklyn, N. Y., for its new three million dollar plant in Pennsylvania. The new building is a one-level affair, which occupies 7 acres of a 38-acre site, and has extensive product design and research laboratories.

Eleventh General Assembly of I.U.G.G.

The Eleventh General Assembly of the International Union of Geodesy and Geophysics was held in Toronto, Canada, September 3–14, 1957. At the present time fifty nations are members of this Union. More than twelve hundred delegates from the member countries, as well as many representatives from nonmember countries, participated in the scientific programs of the seven associations comprising the Union.

The membership of the American Congress on Surveying and Mapping has a direct interest in the International Association of Geodesy. At one of the scientific meetings of this association special reports were received concerning the use of the Geodimeter and the Tellurometer in other countries. Any one who is operating an instrument using light or electromagnetic waves would be interested in learning that the I.U.G.G. adopted a resolution that 299,792.5 ± 0.4 km/sec be adopted as a constant for the velocity of light in vacuo and that they continue their efforts toward a further refinement of this value.

The International Association of Geodesy is making plans to hold an International Symposium on the development and application of length-measuring instruments of this type. This international meeting will probably he held in Washington, D. C., in the spring of 1959, during the week immediately preceding the consecutive meetings of the American Congress on Surveying and the American Society of Photogrammetry.

A. S. C. E. Manual 10 Revised

In any community, be it large or small, boundaries of the original land subdivisions are the basis for all subsequent subdivisions. A "city survey" is a must for the sucessful operation and development of any community.

The original ASCE Manual of Engineering Practice No. 10 "Technical Procedure for City Surveys" was first published in 1934 and was well received by the engineering public. Demand for the manual required substantial reprintings in 1950 and 1953. Increased use of aerial photography and photogrammetry, and the rather wide acceptance of the state plane-coordinate systems that were introduced after the issuance of the original manual, made revision imperative to bring Manual 10 up to date for the most modern and accepted practice.

The committee which brought out the original manual published in 1934 included R. H. Randall, *Chairman,* U. N. Arthur, R. H. Simpson, and George D. Whitmore.

The revision was accomplished by the Committee on City Surveys of the Surveying and Mapping Division of the ACSE. The committee was made up as follows: George D. Whitmore, *Chairman,* Charles A. Blessing, G. Brooks Ernest, L. T. Eliel, Lansing G. Simmons, and Robert H. Smith. All members of this committee, with the exception of Mr. Blessing, are members of ACSM.

It is of considerable interest to note that two members of the committee which prepared the original manual later became president of the American Congress on Surveying and Mapping —R. H. Randall was the first president of ACSM, and George D. Whitmore was our third president.

Of particular interest to the members of the Property Surveys Division is the revised section on Property Survey which was reviewed by another former president of ACSM, Sol A. Bauer.

ACSM member Morris M. Thompson, formerly chairman of the Publications Committee, assisted materially in preparing the final draft of the new section on Photogrammetry.

This important manual is available to nonmembers of ASCE for $3.00 from the American Society of Civil Engineers, 33 West 39th St., New York 18, N. Y. Members of ASCE may obtain the manual for $1.50.

VIII Pan-American Consultation of Cartography

The Eighth Pan-American Consultation on Cartography will be held in Havana, Cuba, February 12–21, 1958, under the auspices of the Government of Cuba, through its National Planning Board, and under the sponsorship of the Commission .on Cartography of the Pan American Institute of Geography and History.

Recent Action of A.S.C.E. Task Committee on Status of Surveying and Mapping

The April–June 1957 issue of SURVEYING AND MAPPING carried a reprint of an interim report received on October 18, 1956, by the Surveying and Mapping Division of the American Society of Civil Engineers from its Task Committee on the Status of Surveying and Mapping. A second interim report was recently submitted by the Task Committee. Although it has not been officially released, it is understood that the report includes the following significant points:

(1) That during the past year, more than 70 comments and discussions were received, many of these being "official" opinions of State and local-level groups of engineers and/or surveyors.

(2) That, except for property-boundary surveying, these comments were overwhelmingly in approval of the Committee's position of a year ago as to which activities were engineering, and which were non-engineering.

(3) That a majority of the commentators differed with the Committee's tentative finding that property-boundary surveying should henceforth be regarded as a profession separate and distinct from civil engineering. In 1956 this finding was felt by the Committee to be mandatory, as it was based on resolutions and reports by special committees on NCSBEE in 1949 and 1956 and NSPE in 1952.

(4) That in view of this response the Committee now feels compelled to retract its 1956 finding that perhaps the time is opportune to advocate separation of property-boundary surveying from civil engineering.

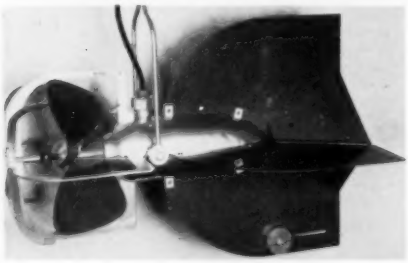
(5) That the Committee believes there is a good chance that a satisfactory solution to the dilemma resulting from separate registration for land surveyors (cadastral) and professional engineers can be evolved that will be satisfactory to all concerned, but that another year should be allowed in order to develop such a proposal and try it out on representative groups throughout the country.

Another action recently taken by the Task Committee was to request ACSM to appoint a representative to work with the ASCE Task Committee. The assignment of this important task to a qualified representative of ACSM is to be made shortly.

More information on this important subject will be presented in future issues of SURVEYING AND MAPPING.

—ROBERT H. LYDDAN
President, ACSM

C. & G. Survey Current Meter Improved



NEW C. & G. SURVEY CURRENT METER

The Coast and Geodetic Survey has devised for its own use an improved current meter that will measure under-surface currents moving as slowly as nine feet per minute. It will be useful in studies of harbor pollution from sewage and of possible contamination by atomic wastes.

The new meter, which is thirty inches long, is suspended from a buoy that contains a radio transmitter. It heads into the current and its impeller turns at a rate reflecting the speed of the water. Coded signals giving the direction and velocity of the current are sent from the buoy to an observing post and there recorded on tape. The operation of a number of buoys can be supervised from one post.

This is the latest modification of the meter invented in 1942 by Captain Elliott B. Roberts of the Survey. The latest changes, including the use of plastic materials and flat instead of curved impeller blades, were made by Anthony Goodheart, Douglas L. Parkhurst, and William Leimbach.

The meters previously available would measure currents as slow as three tenths of a knot, or about 30 feet per minute. The modification which cuts this to nine hundredths of a knot, was needed to meet changed conditions.

The Survey is building thirty of the new meters in its own instrument shop. Two other institutions interested in oceanography have asked for information to enable them to construct their own meters.

PROGRAM PREVIEW—the coming March annual meetings

1958 ACSM—ASP Consecutive Meetings and Co-Exhibit

March 23–29, 1958, Shoreham Hotel, Washington, D. C.

ACSM Eighteenth Annual Meeting—March 23, 24, 25, 26
Sessions—Monday, Tuesday, and Wednesday morning

ASP Twenty-fourth Annual Meeting—March 26, 27, 28, 29
Sessions—Wednesday afternoon, Thursday, Friday

The 1958 Consecutive Meetings of the American Congress on Surveying and Mapping and the American Society of Photogrammetry will present important technical papers discussing new developments in Instrumentation, Surveying, Mapping, and Photogrammetry, attuned to the International Geophysical Year, the Federal Highway Program, President Eisenhower's Open Skies Policy, and other professional matters concerned with the various fields of surveying and mapping.

The co-exhibits, in the new and larger exhibit hall, offer the largest and best arrangement ever displayed. Some exhibit space may yet be available if you hurry. For information, contact Glenn H. Landis, Chairman, Co-exhibits Committee, 610 Montgomery St., Alexandria, Va.

ACSM PROGRAM: All Technical Divisions except Instruments will have separate Division meetings on Monday, March 24, 10:00–12:00 a.m. The Property Surveys Division will have an extra separate session on Tuesday from 5:00–6:30 p.m. The ACSM-ASP Cocktail Party will be held Monday evening, 8:00–10:00 p.m. The ACSM Annual Business Meeting will be Tuesday evening, at 8:00 p.m., and we hope to obtain a suitable travel or educational movie to lead off this session.

Cartography: At the separate meeting a panel of cartographic experts will offer: "Technique Trends in Photogrammetric and Nonphotogrammetric Map Compilation and Drafting." There will be a paper on "Special Requirements for Chart Projections and Grids for Present-Day Air Navigation," with special emphasis on the high-speed aspects. An "Interim Report on the Staphograph" will describe a new process for the application of map names and symbols. The usual Division business meeting will follow.

At the plenary session (Tuesday, 3:00–4:30 p.m.) an internationally known electronic design engineer, who has investigated prospects for cartographic automation techniques, will report on his work in a paper, "Can We Mechanize Cartography?" A nationally recognized cartographer will suggest ways to use symbols and colors, as they affect scale and perspective, in "New Concepts in Map Design." Discussion periods will follow both presentations.

Control Surveys: The theme of the separate meeting will be: "Relations of the Lunar and Satellite Programs to Control Surveys on Earth." A brief business meeting will be held for election of officers and other Division business.

At the plenary session (Monday, 1:30–3:00 p.m.) a panel will present brief statements on "Tellurometer: Electronic Distance Measurement." The panel members will include two from among the commercial users, one from Canadian and one from U. S. agency users, and a service expert. Questions within the panel and from the floor are expected to be vigorous and of widespread interest.

Education: The separate meeting will feature a paper, "The Engineering Measurement Approach to Engineering Education," by Prof. Francis H. Moffitt, to be followed by prepared discussions of the paper by Professors Ralph M. Berry, John O. Eichler, and Charles L. Miller. A short business session will conclude this meeting.

The subject planned for panel discussion at the plenary session (Tuesday, 1:30–3:00 p.m.) is "Mapmaking" or "The Proper Expression of Survey Data." Panel members are being obtained from Aero Service Corporation, the American Geographical Society, General Drafting Company, and the U. S. Geological Survey.

Instruments: It is anticipated that the Instruments Division program at the plenary session (Tuesday, 10:00–12:00 a.m.) will consist of field experiences and instrument problems and uses as encountered by field survey and engineering parties while establishing the basic ground controls and points on the "Dew Line Project." This project, according to the field engineers, was the most rugged survey work encountered in recent years, one which taxed to the utmost the performance of both men and instruments.

The exhibit of historical instruments assembled at the College of William and Mary for "Surveyors' Day" and the Jamestown Festival, which was such a success, will be duplicated and expanded as a part of the Instruments Division activity for this year's meeting. Among the instruments to be exhibited will be: Thomas Jefferson's theodolite, George Washington's Chandlee Surveyor's Compass, an ancient astrolabe approximately 2,000 years old, instruments used by Admiral Byrd on both Arctic and Antarctic expeditions, the original Hell Gate transit, and many others.

The plenary session will be followed by a short Division business meeting for the election of officers and for other necessary business.

Property Surveys: The first separate session of the Property Surveys Division will include Land Surveyors' National Congress; Committee progress reports and discussions on proposals for Land Surveyor Model Registration Law, Land Surveyor Fees and Salaries, Land Surveyor Canon of Ethics, a further report and discussion on Fair Labor Standards, and open discussion of other current issues relating to land surveying.

The second separate session (Tuesday, 5:00–6:30 p.m.) will include a discussion of affiliate organizations sending direct representatives and appointing them as "Division Advisors." There will be summaries of Division progress, committee reports, and of Division objectives, current and future; discussion leading toward adoption of revised Division Bylaws and Division resolutions; election of Division officers; and committee and task assignments.

The plenary session (Monday, 3:00–4:30 p.m.) will feature a panel discussion, "Practical Applications to Property Surveys of the Federal Highway Program." Panel members from private practice, Highway Departments, the Army Engineers, and the Bureau of Public Roads will consider practical applications by private practitioners of the highway surveys for control. They will discuss preservation of monuments, use and filing of their survey values, records and notes, and property-line evidence.

Topography: At the separate meeting of the Topography Division, the results of a widespread Government-agency survey will be the basis for a paper, "The Effect of User Requirements on Map Design," with discussion to follow. Two other papers and their discussion will be announced later. There will also be a short business meeting.

At the plenary session (Wednesday, 9:30–11:00 a.m.) the unusual requirements and techniques required in "Surveying in Louisiana Offshore and Coastal Areas" will be reported by the Louisiana Section, ACSM. A current topic, "Civil Defense Use of Maps in Wartime and Natural Disasters" will be presented by a representative of the Federal Civil Defense Administration. Brig. Gen. Martin Hotine, Director of Overseas Surveys, England, will speak on "The Emphasis on New Techniques and Imaginative Planning in the Mapping of Outlying Areas."

KEY SPEAKER: Dr. Lawrence Gould, President of Carleton College, Northfield, Minn., and Director, United States International Geophysical Year Antarctic Program, will discuss the interests of ACSM and ASP in the IGY program through appropriate reference to the satellite, latitude and longitude determination, and Antarctic programs. Dr. Gould's experience in the Arctic and the Antarctic, his education, work, and committee assignments make him extremely well qualified to tell us about these programs.

ASP PROGRAM: The technical program of the American Society of Photogrammetry is being developed about the diversified interests of its members. In support of the general theme, "The Role of Mapping in the International Geophysical Year," there will be papers on such topics as "Photogrammetric Contributions to the International Geophysical Year" and "Photogrammetry and the Open Skies Policy." As part of the exchange of speakers with the Canadian Institute of Surveying and Photogrammetry, our Canadian guest will present a paper on "The Mapping of the Ungava Peninsula." Several papers will be devoted to the equipment and procedures employed by those photogrammetrists in the topographic field. Nontopographic applications of photogrammetry will be featured in a series of three papers, while the many considerations of photointerpretation and photogeology will be presented throughout the program. A special panel on one facet of photointerpretation will highlight this most important aspect of our program. Concurrently with this panel a series of four or five papers will be presented on the development and employment of the KC-2 camera system. Representatives from the Army, Air Force, and industry will describe how this convergent camera system was conceived, designed, and constructed. The program is planned to present items of interest at both the theoretical and the working level, matters of some complexity as well as general understanding. The speakers have been chosen to provide a stimulating program for all the members, friends, and guests of the society.

GLENN C. WELDEN
Chairman, 1958 ACSM-ASP
Publicity Committee

ATTENTION: ACSM membership in Great Lakes Region

PROGRAM of 17th ANNUAL CONFERENCE
of
MICHIGAN SOCIETY OF REGISTERED LAND SURVEYORS
Pantlind Hotel
Grand Rapids, Michigan

Thursday, February 13, 1958

Morning	Registration and opening session.
Afternoon	"The Land is Yours"—a film production. Panel: Realtor, Abstractor, Attorney. Subject: "What We Expect From the Surveyor."
Evening	General discussion of mutual problems.

Friday, February 14, 1958

Morning	MSRLS—Business Meeting Discussion on plats and a recent court case involving G.L.O. survey.
Afternoon	Survey problems brought about by Super Highways and discussion on central recording of section-corner references.
Evening	Banquet, speaker, and entertainment.

Saturday, February 15, 1958—A.C.S.M. Day

Morning	Early History of the Subdivision of the Northwest Territory, and Photogrammetry for Surveyors.
Afternoon	Business Meeting of Great Lakes Section, ACSM.

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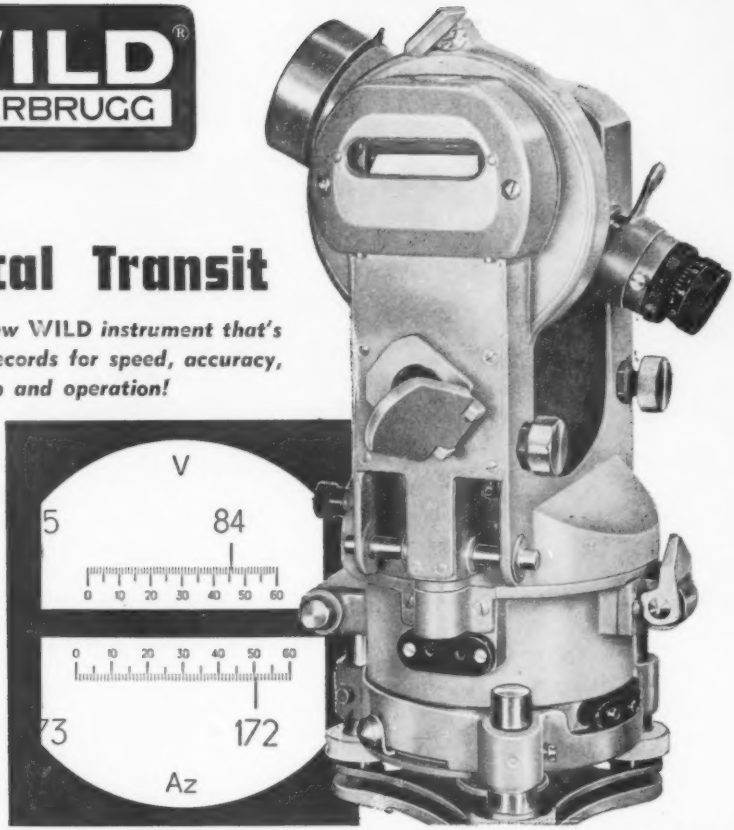

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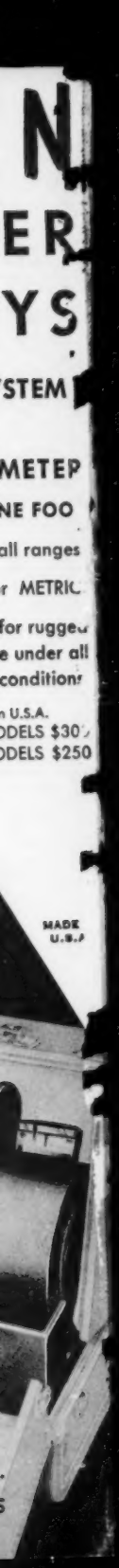
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